

The IRON AGE

April 4, 1957

The National Metalworking Weekly



J. Struve Hensel

**How To Do Business
In Washington**
P. 51

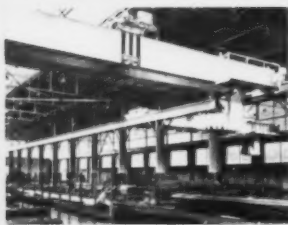
**Building Better
Engineering Managers** – P. 56

**Ratings Simplify
Welding Rod Choice** – P. 91

Digest of the Week P.2-3



METAL WORKING



WAREHOUSE

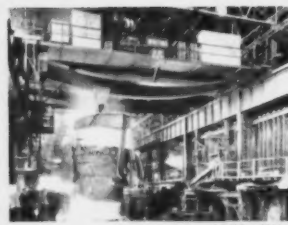


PULP & PAPER

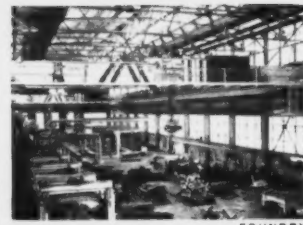
The Crane You Need



HYDRO-ELECTRIC



STEEL MILL

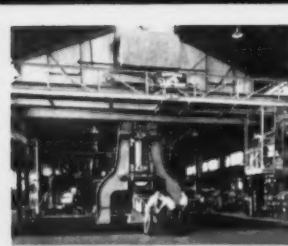


FOUNDRY

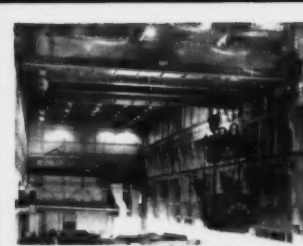
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The IRON AGE

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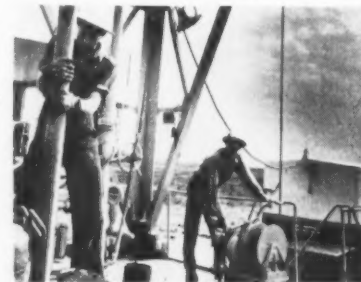
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stocks. Question is whether inde-
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How Do Engineers Rate In Efficiency?

One way to relieve the engineer-
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present personnel. Conference tak-
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The Dave Beck inquiry is only
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of union finances. It will take all
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Legislation must wait. P. 73

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A New High

A new transfer machine is the
showpiece at Reliance Electric &
Engineering Co.'s plant in Ashta-
bula, O. It does the work of 15
machines. P. 77

Metalworking



◀ **GETTING U. S. CONTRACTS:** It's not all peaches and cream says H. Struve Hensel, former top government official. He warns against the pitfalls, and urges a straight-from-the-shoulder approach to Washington. **P. 51**

American Motors' Fate Is Decided

Talk in Detroit that American Motors might drop its Nash and Hudson Lines, has been squelched. President George Romney says that he and Louis Wolfson see eye-to-eye on continuing AMC senior car production. **P. 68**

FEATURE ARTICLES

Rating System Simplifies Welding Electrode Selection

Nine coated electrode specifications cover just about every requirement for manual-arc-welding mild steel. Rating the factors which affect performance—type weld, position, current, etc.—simplifies selection. Here are helpful tips on rating and using electrodes. **P. 91**

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Questions like how furnace temperature affects the heating rate of tool steels aren't academic in hardening and tempering. Studies show tool steel surfaces do not "lead" centers in heating appreciably, requiring long soak times. New findings can alter long heat treating custom. **P. 97**

Flip-Card Records Smooth Production Flow

Effective record-keeping systems are a must for management. A new visible-card system at Boeing saves time for production, inspection, management. System saves almost \$300,000 clerical costs. **P. 100**

Process Puts Higher Profit In Low-Grade Ores

A new smelting process permits yields up to 95 pct from ores that many consider commercially worthless. Ferromanganese production is important application area. Process yields ferromanganese from a 12 pct manganese ore competing in price with that from higher grade ores. **P. 102**

Dextrose Binder Speeds Core Production

Replacing conventional core oils with a dry form of binder derived principally from corn sugar is speeding up core production. Cores bake through in 40 to 50 pct less time than with conventional core oils. There's no metal penetration, either. **P. 104**

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What Power Expansion Means to Suppliers

Electric utilities intend to spend \$3.8 billion this year to increase generating capacity. Long range plans indicate even more expansion ahead. Suppliers look for a decade of unprecedented demand. **P. 58**

NEXT WEEK

Centralized Systems Lower Lubrication Costs

One saving leads to another with centralized lubrication systems. They hit plant operating costs like a chain reaction. Next Week's feature offers an easy way to check their potential in your plant.

How Firms Are Ganging Up On Technical Worker Shortage

It's one thing to gripe about the lack of skilled employees, another to do something about it. Here's how a group of firms joined educational, civic and governmental forces to attack the problem. **P. 59**

Stockpile Spending Fades Away

Don't count on stockpile buying, or barter deals to hold up markets much longer. Congress is slashing ODM budget for buying strategic materials. Outlook is activity in both fields will be cut in half. **P. 60**

Plastics Sales Skyrocket On West Coast

The industry is big business in that area, accounting for \$200 million in sales every year. Reinforced plastics are getting more attention from construction. **P. 75**

Steel Brokers Are Running For Cover

Increasing availability of light plate is forcing part-time steel brokers to sing another tune. Competition from the mills makes it possible for users to haggle over price and delivery dates. **P. 143**



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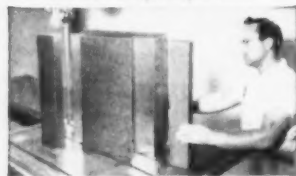
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B-39



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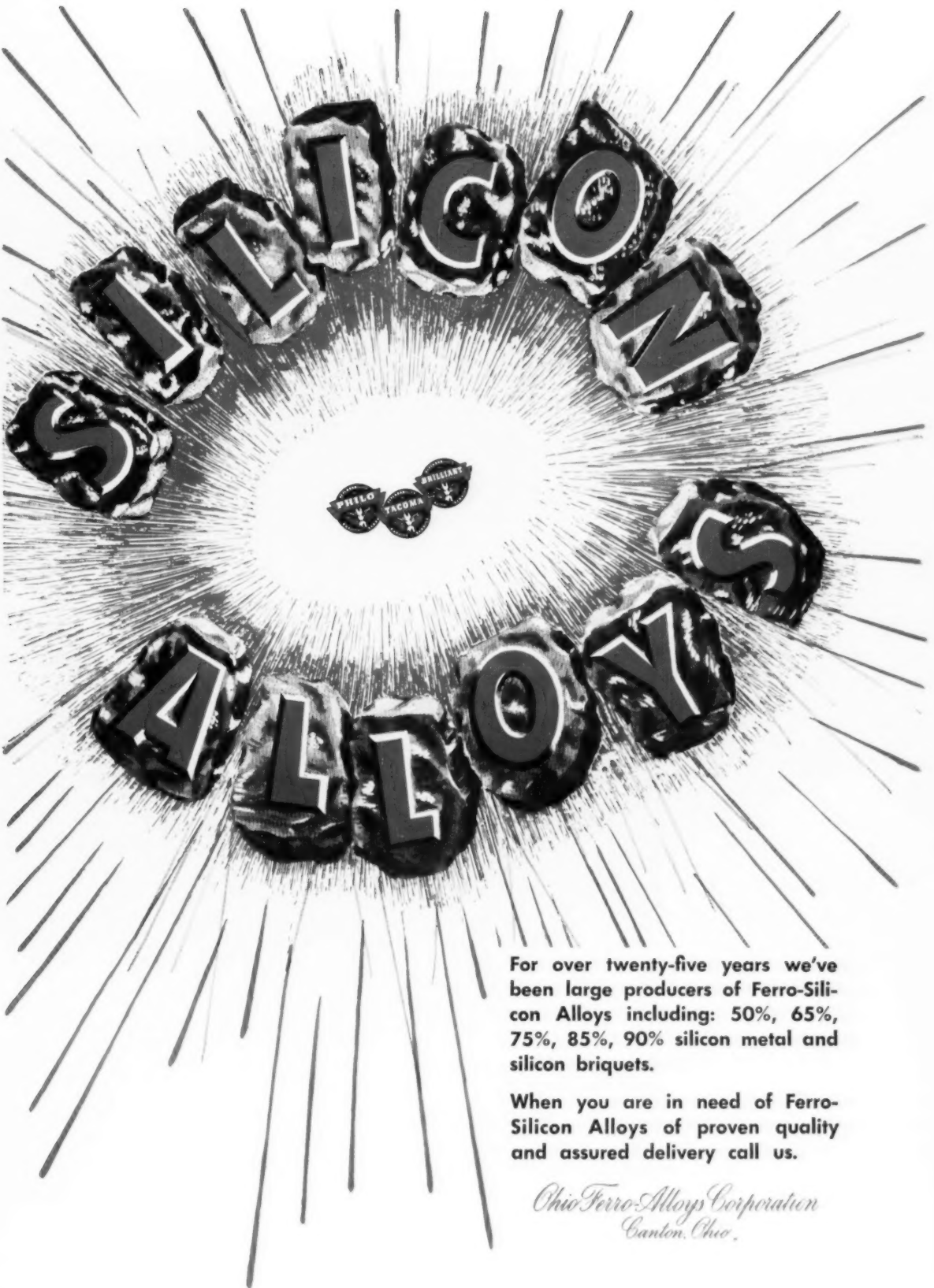


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THE IRON AGE EDITORIAL

Bone Up On Semantics

It May Help Your Business

Looking at some charts, reading some business reports and listening to some people talk, you would think we were in a recession. At times you might feel that an old-fashioned depression was due.

We make up our minds and outlook from what we read, see and hear. But these judgments are helped by whatever effect those senses have upon our brain and upon our emotions.

Never was there a time in recent years when so much ink has been splattered around about a "downturn." It seems we take an almost sadistic pleasure in pouncing upon each morsel of "bad" news. We probably pay more attention to so-called bad news than we did to "good" news last year.

The general theme today seems to be that if we are not headed for the roof we must drop to the cellar. The facts do not suggest this but many words used in describing the current business outlook try to make that point. This is giving the followers of semantics a field day.

Semantics, as you know, is the study of the meanings and the development of meanings of words. It also gets into the unconscious reactions of people to particular words or symbols.

If someone said steel operations slumped, you would think that was bad. Even if you found

that the change was but a few points it would be too late to recall the emotional effect of the word "slump."

Suppose you were looking at a sales chart which showed a sharp fall-off in the trend. Right off the bat the angle of the drop would hit you. The impact would still be with you if you found that the chart overemphasized the drop. Even if the decline were only 10 pct but looked like a 50-pct slide, the damage is done.

Say you are scanning a report on heavy producers' inventories. They are high. That could be bad. But not if orders are up and not if backlogs are bigger than a month ago or a year ago. You need all three factors here to get a clear picture.

Assume a company lays off 350 people. That means little unless you know the total number of workers now and a year ago, what caused the layoff and how long it will last. A recent layoff at a supplier's works was due to a strike at a customer's plant. Would you check that far before the word layoff hit you in the stomach?

Before you run out and cancel orders, lay off people, cut your budget or get your nerves all frayed, take a good look at the words. They may not describe the facts—and they're what you want.



Editor-in-Chief



Metal removal costs too high ?

Carborundum's new M-A-P Method gives you a chance to compare the advantages of coated abrasives

Maximum Automation Potential

is a metal removal prediction method—predicts cost savings and production increases with the use of abrasive belts on your present or planned production operations. M-A-P is a *new* engineering service provided by The Carborundum Company. Now you can *compare* the advantages of using abrasive belts on either heavy metal removal or on the finishing or semi-finishing operations of any component part you manufacture.

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LETTERS FROM READERS

Businessmen

Sir—We were very much impressed with your recent editorial "Be-Kind-To-Businessmen Week."

In fact, we would like very much to give a copy to each one of the members of our Foremen's Group. If you have a supply of these on hand, we would greatly appreciate your forwarding about thirty copies to us for distribution on that date. **J. A. Perkins, Executive Asst., Superior Steel & Malleable Castings Co., Benton Harbor, Mich.**

Lubricant Guide

Sir—I realize that I may be too late, but would you by any chance have 10 or 12 reprints of the article "Save by Knowing Your Drawing Lubricant Ingredients" which appeared in the Oct. 25, 1956 issue?

We are undertaking a project to write a guide for the selection, testing and use of die lubricants for use by various plants in the General Motors Corporation and feel that there is much basic information in this article. The multiple copies are needed to provide each member of the writing team with the same information. **B. A. Smith, Production Engineering Section, General Motors Technical Center, Detroit, Mich.**

You're not too late.—Ed.

Award Winner

Sir—We have read with extreme interest your Feb. 7 article in which you stress the need for improvement of service manuals within the Machine Tool Industry.

Our company was founded in 1946 to meet the very need which you have so ably expressed in your article. To raise the standard of service literature, we pioneered and developed our unique method of

Truspective illustration for machine parts catalogs.

Among the machine tool manufacturers for whom we prepare Truspective catalogs are The Blanchard Machine Co., Jones & Lamson, Potter & Johnston, Waterbury-Farrel, and The Abrasive Machine Tool Co.

It was the last named who received first prize recognition at the National Machine Tool Builders' 1956 Advertising Competition. The catalog entered was the 1218 Parts Catalog And Operators Manual illustrated and published by this company. **J. B. Clark, Sales Mgr., The Purnell Co., Boston, Mass.**

Machinability

Sir—This Headquarters was very favorably impressed with the timeliness and informativeness of the article "Machinability Testing: Science or Fiction?" in your Feb. 28 issue. We would appreciate three reprints of this article. **R. A. Jones, Lt. Colonel, USAF, Chief, Materials Branch Equipment Div., Air Research and Development Command, Baltimore, Md.**



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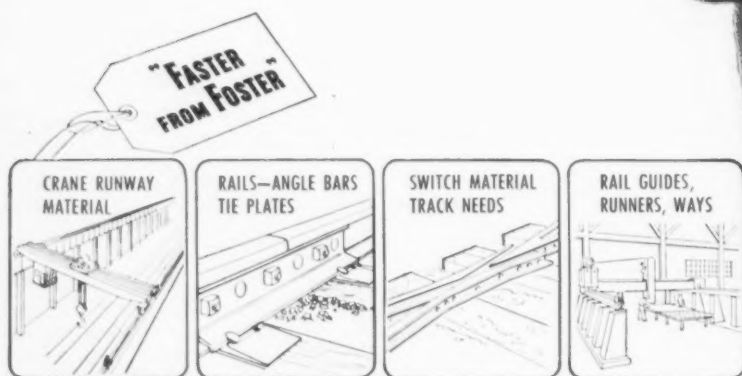


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Over the years, new products come and old ones go. With welding electrodes, more survive than perish. At present, there are nine electrode classifications which will take care of any need in welding mild steel.

To have such a selection is fine. But which of these nine do you use for overhead welding? Which is best for getting deep penetration? Or soundness? Easy slag removal? Obviously, you can't have the best of everything in one electrode.

Simplify Job — The feature on p. 91 simplifies the whole job of selection. It shows how each type of electrode rates from almost every conceivable angle. Your choice of electrode may be a compromise—but you'll get the best combination of characteristics for any given job.

It's a timely subject too. You'll profit from it by getting better welds at lower costs. That's the theme you'll be hearing more about at the Welding Show in Philadelphia April 8-12.

Pushbutton Lubrication

It's sad but true that most lessons in life are learned the hard way. Take centralized lubrication, for example. You'd think that the multiple benefits inherent in a controlled, automatic lubrication system would be quite obvious.

Even the young lady in her new car knows that a push on that dashboard button is easier than lining up regular trips to the service station. She doesn't mind dazzling the man on the grease rack, but what if he should forget to squirt all those places under the car; that would be carrying the dazzle too far. (Who could blame him for missing a fitting or two?)

No More Worries—Anyway, she doesn't have to worry about this anymore. And she can thank Lincoln Engineering Co., St. Louis, for selling Ford Motor Co. on the idea of an automatic lubrication system.



How about you—when it comes to the bearings in your plant equipment? All too often the story goes like this: "We lost a main bearing on a press because the man forgot to oil it. We installed an automatic lubricator."

Putting in one of these systems before you have big trouble makes a lot of sense—and can save you a lot of money in at least a half-dozen important operating - cost areas. We'll tell more about it in our article on centralized lubrication systems next week.

Puzzlers

Never realized how popular the Butcher, Candlestickmaker and the Chorus Girl Puzzler would be. In the second hundred of answers (all correct) are: Daniel E. Chiricosta, The Buckeye Incubator Co., Springfield, Ohio; W. Craig Colledge, Tidewater Oil Co., Calif.; Lenore A. Kovach, Ford Motor Co., Berea, Ohio; J. R. Howell, Sylvania Electric Products, Warren, Pa.; Ann Wiebking, Maryland Shipbuilding & Drydock Co.; K. B. McCullogh, National Carbon Co., Toronto.

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**SIMONDS
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**SWISS PATTERN
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For precision work where the craftsman's
delicate touch is a matter of pride
and profit.

ROTARY FILES

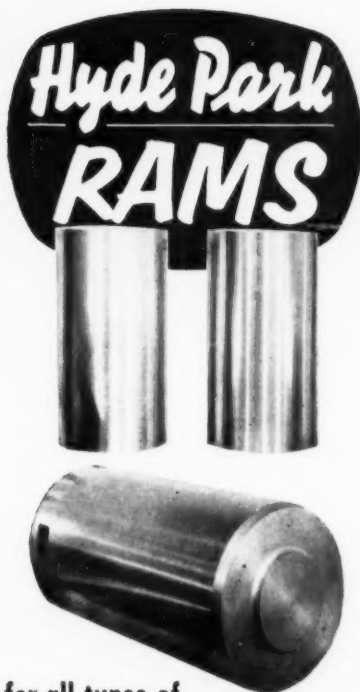
For power driven filing in tool and die
shops, pattern shops, aircraft and
automotive plants, machine
shops, foundries.



**VIXEN[®]
Milled Curved-Tooth
FILES**

For fast, smooth work on lead,
babbitt, zinc, aluminum, bronze,
plastics, cast iron and steels
— everywhere.





for all types of HYDRAULIC EQUIPMENT

Hyde Park Rams are available in Chilled or Alloy Iron.

Furnished in hardness range to meet your specification... ground to your required size.

On your next replacement of Rams — or for new equipment—consult us. Our engineers will be glad to assist you.

Red Circle Rolls for every Purpose

Rolling Mill Equipment
Gray Iron Castings up to 80,000 lb.



Hyde Park

FOUNDRY & MACHINE CO.

Hyde Park, Westmoreland Co., Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

EXHIBITS, MEETINGS

Welding Show—Apr. 8-12, Philadelphia. (American Welding Society, 33 W. 39th St., N. Y.)

Engineered Castings Show—May 6-10, Cincinnati. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Design Engineering Show—May 20-23, New York. (Clapp & Poliak, 341 Madison Ave., N. Y. 17).

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22).

Metal Show—Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3).

APRIL

National Screw Machine Products Assn.—Annual spring meeting, Apr. 7-11, Shoreham Hotel, Washington, D. C. Society headquarters, 2860 E. 130th St., Cleveland.

American Society of Mechanical Engineers—Spring meeting, Apr. 8-10. Dinkler-Tutwiler, Birmingham, Ala. Society headquarters, 29 W. 39th St., New York.

Metal Treating Institute—Annual spring meeting, Apr. 8-10, Boca Raton, Fla. Society headquarters, 271 North Ave., New Rochelle, N. Y.

American Institute of Mining, Metallurgical, and Petroleum Engineers—Annual conference of the Blast Furnace, Coke Oven, and Raw Materials Committee and the National Open Hearth Steel Committee, Apr. 8-10, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 29 W. 39th St., New York.

Malleable Founders' Society—Market development conference, Apr. 10-11, Edgewater Beach Hotel, Chi-

A COMPLETE REFRACTORIES SERVICE...

for the Steel Industry

OLIVE HILL BF and OLIVE HILL HI-FIRED brick rank high in any list of prominent and widely used brands of blast furnace refractories. Manufactured from dense-burning Kentucky flint fire clays by Grefco's unique manufacturing processes, OLIVE HILL brick set a standard for blast furnace refractory quality and workmanship.

Grefco processing of OLIVE HILL brick entails:

1. Careful selection, testing, stockpiling and blending of fire clays to insure uniform raw material quality.
2. Grinding and screening to prescribed formula to promote high density of product.
3. Efficient deairing during brick forming, also to promote density and proper physical structure.
4. Careful firing to exacting temperature schedules yields uniform high quality brick.
5. Close inspection of final product with gauging and sorting of brick to close size tolerance.
6. Quality control by statistical analysis procedures for the manufacturing processes.

In service, OLIVE HILL blast furnace brick, both BF and HI-FIRED, have produced many splendid performance records in the past. OLIVE HILL linings in presently operating furnaces, are giving outstanding performance and are more than meeting the increasing requirements of the expanding American Iron and Steel Industry.

GENERAL REFRACTORIES CO.
Philadelphia 2, Pa.

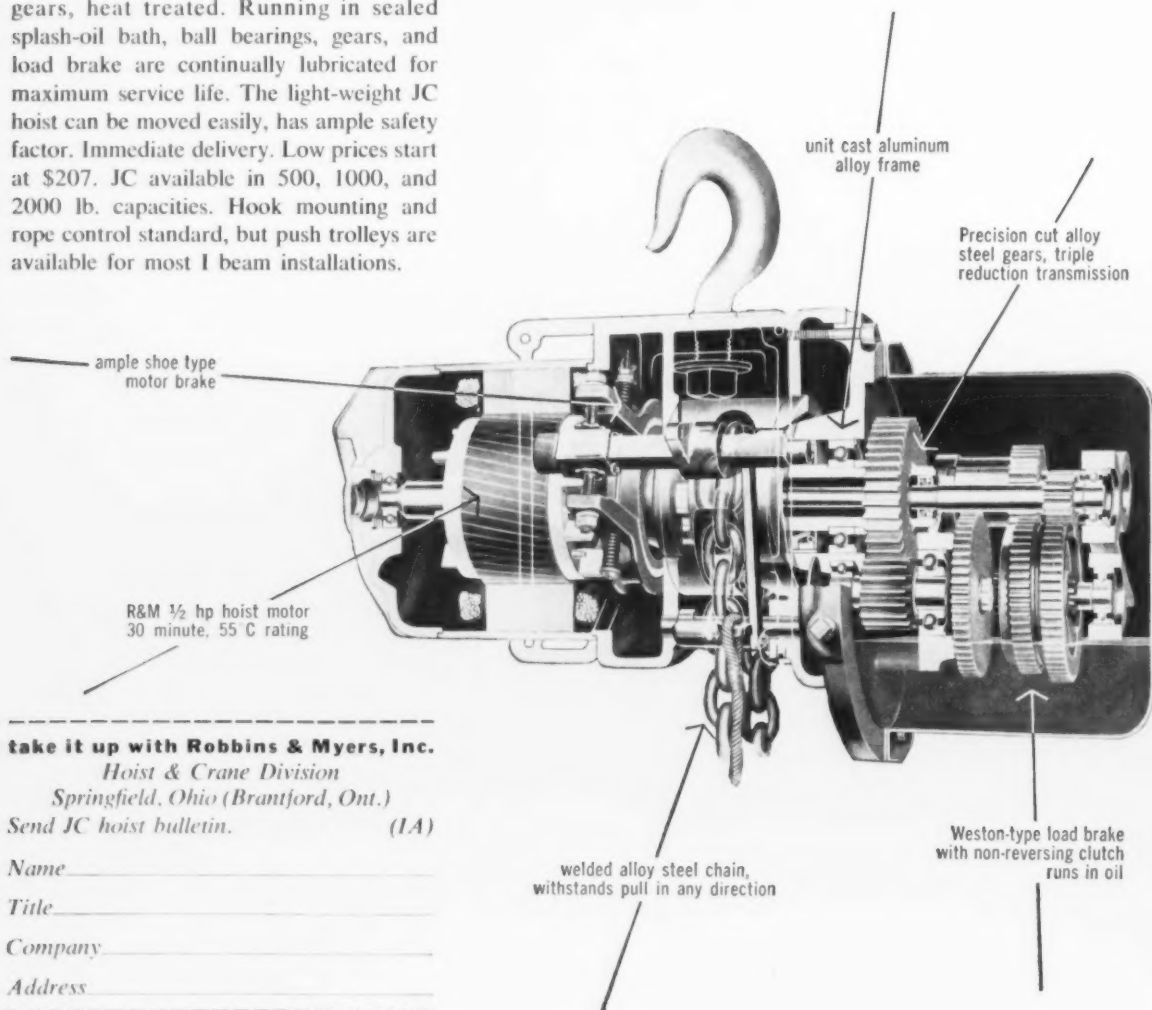


GENERAL REFRACTORIES



R&M JC chain hoists are ahead of competition in quality—right with it in price. See for yourself why more value for the same money is yours in the JC. The ½ hp R&M heavy duty motor is equipped with an oversize shoe brake to assure quick stops, accurate load spotting, longer life. Separate load brake is Weston-type, with non-reversing clutch to prevent drift. Gearing—triple reduction precision cut alloy steel spur gears, heat treated. Running in sealed splash-oil bath, ball bearings, gears, and load brake are continually lubricated for maximum service life. The light-weight JC hoist can be moved easily, has ample safety factor. Immediate delivery. Low prices start at \$207. JC available in 500, 1000, and 2000 lb. capacities. Hook mounting and rope control standard, but push trolleys are available for most I beam installations.

quality to spare



take it up with **Robbins & Myers, Inc.**
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)
Send JC hoist bulletin. (1A)

Name _____
Title _____
Company _____
Address _____

ROBBINS & MYERS hoists • cranes • winches

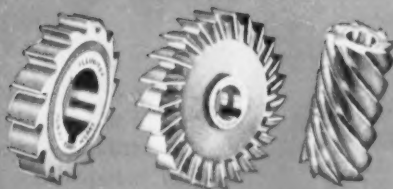
Skilled Hands Deserve

ILLINITE[®] MILLING CUTTERS

available from your **ILLINITE** distributor:

STANDARD MILLING CUTTERS FROM STOCK
SPECIAL MILLING CUTTERS TAILORED TO THE JOB

Today's expert workmen get the most out of modern, high speed production machines by using the finest metal cutting tools . . . Illinite Milling Cutters. Your Illinite distributor offers off-the-shelf availability on standards, prompt service on made-to-order specials. He offers a complete service in metal cutting tools of high uniformity, long life and fine finish . . . tools that have made Illinois Tool Works a recognized metal cutting tool leader for nearly fifty years. Call him today for fast, complete metal cutting tool service! You'll be glad you did.



ILLINITE[®]

Metal Cutting Tools

DIVISION OF ILLINOIS TOOL WORKS

2501 N. Keeler Ave., Chicago 39, Illinois





"MACHINERY ANALYZER saves us \$1000 per hour..."

"We've had total savings of more than \$100,000 since we purchased the analyzer three years ago. The analyzer has been shipped over 100,000 miles by air, rail, and car to our eight plants without need for repairs or replacements" — reports a leading chemical processor.

The Machinery Analyzer — actually a portable IRD Vibration Analyzer — is used for . . .

- **TROUBLE-SHOOTING** — to pinpoint faulty components exciting vibration *without costly dismantling*.
- **MEASURING DISPLACEMENT** — to accurately determine the condition of machinery *without costly dismantling*.
- **IN-PLACE BALANCING** — to dynamically balance at operating speed the accessible rotating components *without costly dismantling*.

Here are several examples cited by company officials:

- Detecting a broken gear in an important gear reducer saved a major loss of production.
- Savings of \$2000 in balancing a ringer assembly because dismantling and loss of production were eliminated.
- A 450 HP motor was balanced, in place, at savings of \$8000 to \$10,000 in production and maintenance costs.

What portable IRD Vibration Analyzers are doing for this company — to reduce inspection, maintenance, and production costs — it can do for your company.

IRD

For further information — or an actual demonstration on your own machinery by an IRD field engineer — write today to International Research and Development Corporation, 797-1A Thomas Lane, Columbus 16, Ohio.

EXHIBITS, MEETINGS

Continued from P. 13

cago. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Home Laundry Manufacturers Association — Annual meeting, Apr. 14-17, French Lick Springs, Ind. Association headquarters, 20 N. Wacker Dr., Chicago.

American Society of Lubrication Engineers — Annual meeting, Apr. 15-17, Sheraton-Cadillac Hotel, Detroit. Society headquarters, 84 E. Randolph St., Chicago.

Copper and Brass Warehouse Assn. — Meeting, Apr. 24-27, Hollywood Beach Hotel, Hollywood, Fla. Society headquarters, Investment Bldg., N.W., Washington, D. C.

SAM-ASME — Twelfth annual management engineering conference, Apr. 25-26, Hotel Statler, New York. Society headquarters, 74 Fifth Ave., New York.

American Zinc Institute — Annual meeting, Apr. 25-26, Drake Hotel, Chicago. Society headquarters, 60 E. 42nd St., New York.

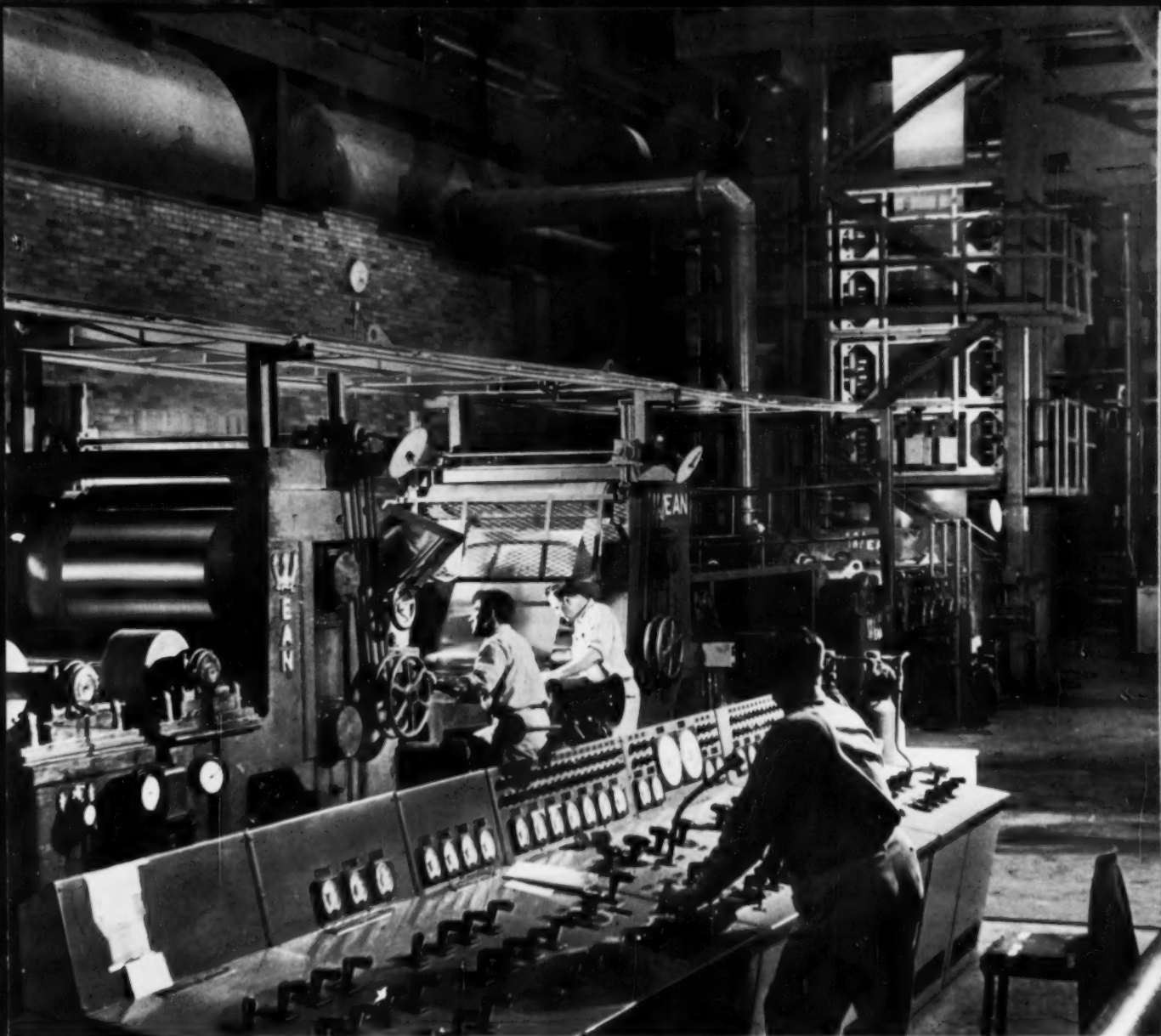
Scientific Apparatus Makers Assn. — Annual meeting, Apr. 27-May 2, Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 20 N. Wacker Dr., Chicago.

Assn. of Iron & Steel Engineers — Spring conference, Apr. 29-May 1, Netherland Plaza Hotel, Cincinnati. Society headquarters, 1010 Empire Bldg., Pittsburgh.

Metal Powder Assn. — Annual meeting, Apr. 30-May 1, Drake Hotel, Chicago. Society headquarters, 130 W. 42nd St., New York.

MAY

Copper & Brass Research Assn. — Annual meeting, May 12-15, The Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., New York.



More tin plate . . . mirror finish, precise alloy

Westinghouse line drive and control equipment for exacting, high-speed reflow methods helps your electrolytic tinning lines produce more salable tin plate . . . faster.

*Here's how you can give your tin plate
a competitive edge* →

YOU CAN BE SURE...IF IT'S Westinghouse



With Westinghouse radio-frequency equipment . . .

Smooth, lustrous tin plate at speeds of 2100 fpm, and beyond

Westinghouse equipment for tin-plate reflow operations helps you produce the delicate alloy balance necessary to form tin cans easier, maintain high production rates.

Westinghouse radio-frequency induction heating equipment for high-speed lines . . . both horizontal and vertical acid type . . . keeps coating thickness precise and constant by automatically adjusting plating current in proportion to line speed. Electromagnetic induction, transferring power to the strip without physical contact, melts the tin and creates a bright, nonporous surface.

This process works so fast that it produces an actual flow line on the moving strip. A photoelectric scanner continuously scans the flow line and uses it to maintain heating at the precise, desired level. There's no overheating or underheating . . . the electric equipment is capable of maintaining speeds of 2100 fpm and beyond. You save valuable tin, reduce menders and boost output of prime tin plate. Production scheduling is simplified because photoelectric scanner handles most changes in gauge and speed without adjustment.

How Line Control Operates

Magamp® magnetic amplifier regulators (VR) control voltage of the entry, main and delivery generators assuring fast, even acceleration and deceleration and minimum loop variation during steady operation. Loop regulators act as verniers in controlling generator voltages.

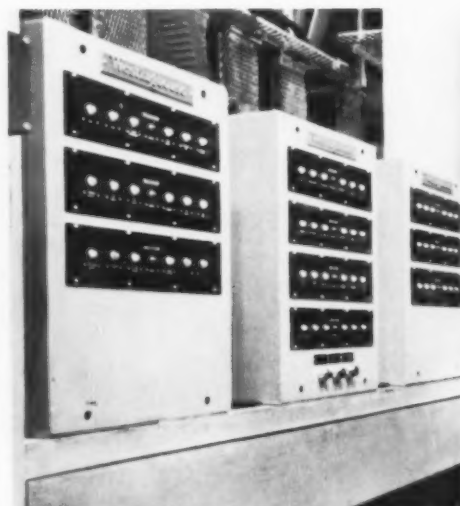
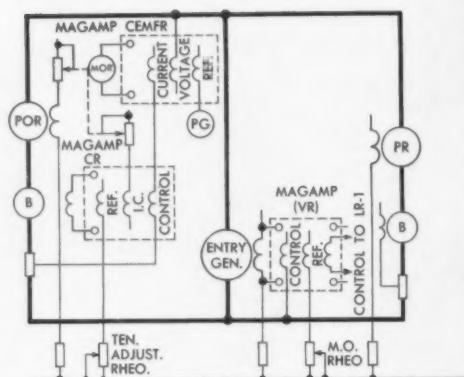
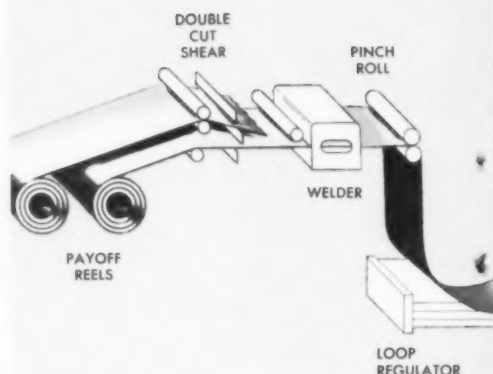
Magamp current regulator (CR) for booster and Magamp counter emf regulator (CEMFR) for motor work together to maintain regulated tension by the pay-off reels (POR) and winding reels (WR). Inertia compensation (IC), proportional to accelerating loads and stall tension signals, is introduced through the (CR) circuits.

Photo-thyratron loop regulators (LR) provide modulated control of storage loops for smooth operation.

Electronic regulators control top and bottom plating current to deposit proper tin coating on each side at all line speeds.

Machine characteristics are selected for optimum drive performance. Entry section pinch roll (PR), master bridge roll (MBR), and drag bridge No. 2 (DB-2), the pace setters of their respective line sections, are shunt-wound for flat speed-load characteristics. Tank drives (T) have high drooping characteristics which result in their developing only the power required to overcome their friction losses and inertia loads. Reel motors have overload capacities suitable for accelerating the large coils now used in most mills.

©Trade-Mark.



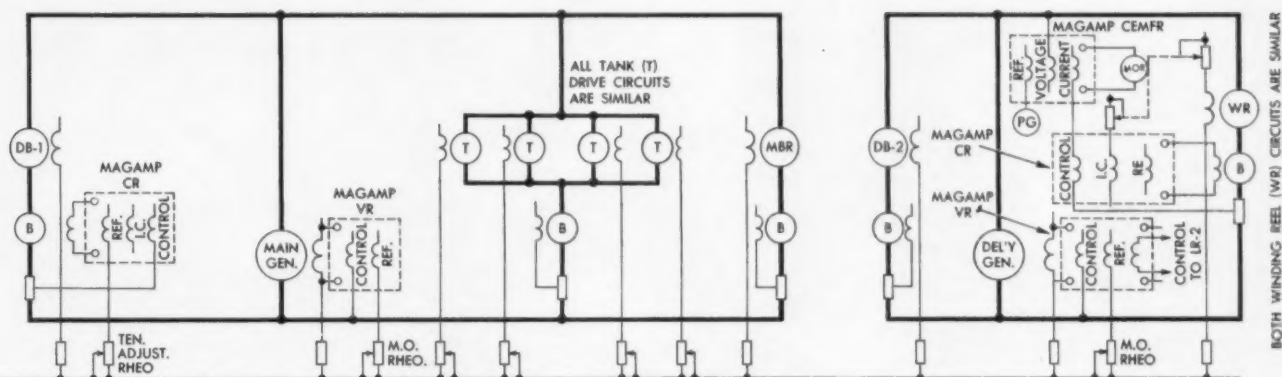
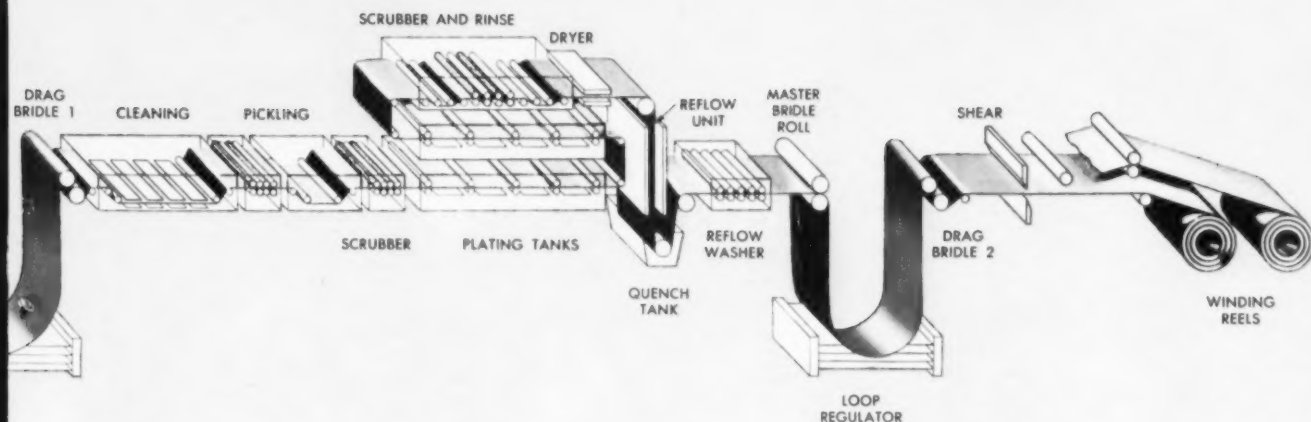
New Westinghouse fault finder monitors control circuits simultaneously, indicates system faults instantly . . . remembers them . . . makes trouble shooting easy.

YOU CAN BE SURE...IF IT'S

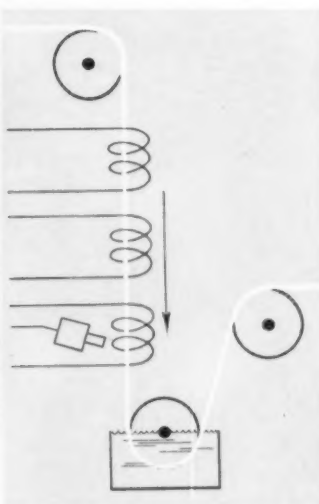
Westinghouse



ELECTROLYTIC TINNING LINE



Westinghouse 2400-kw oscillator equipment supplies high-frequency power to inductor coils. Generator output can be raised or reduced 90% in a couple of seconds.



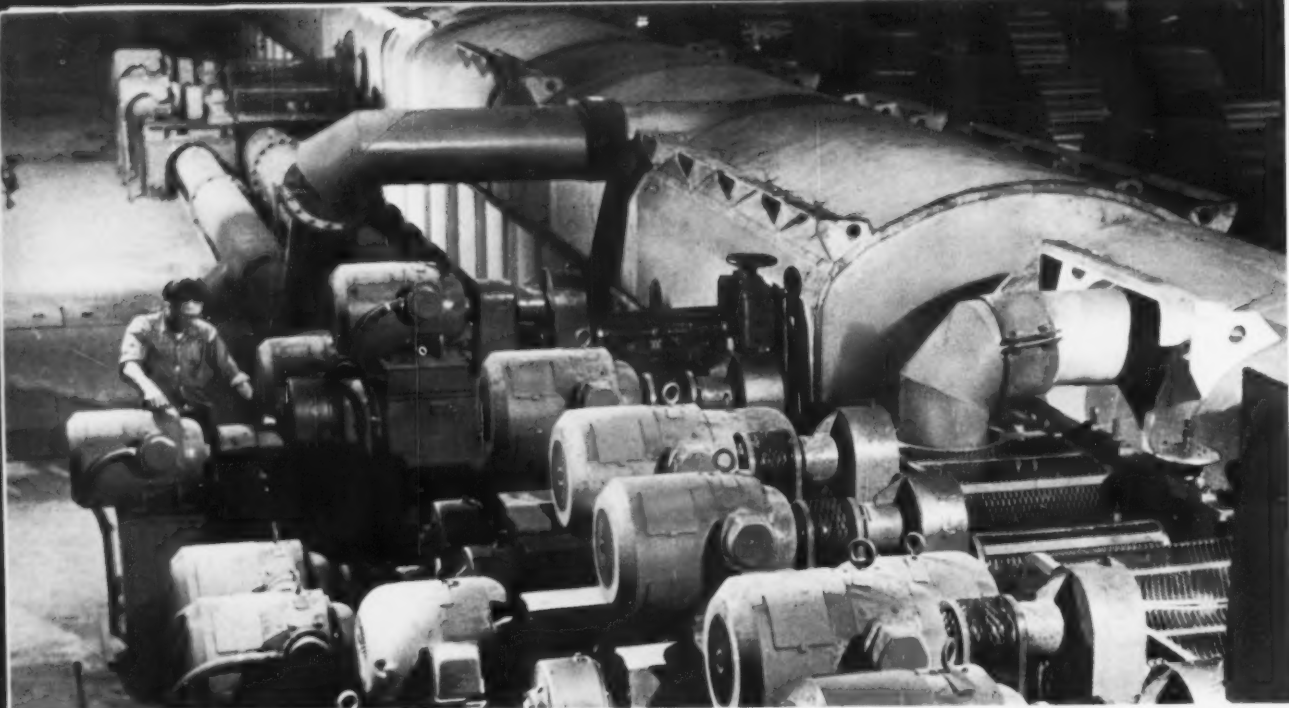
Photoelectric scanner measures light reflection of passing strip, regulates radio-frequency power application in fraction of a second through saturable reactor.

WESTINGHOUSE EQUIPMENT SERVES THESE USERS

COMPANY	LOCATION	RATED LINE SPEED FPM	TIN FLOW EQUIPMENT
Jones & Laughlin Steel Corporation	Aliquippa, Pa.	600	600 kw, RF
Jones & Laughlin Steel Corporation	Aliquippa, Pa.	2100	1800 kw, RF
Republic Steel Corporation	Niles, Ohio	1000	1000 kw, RF
Republic Steel Corporation	Niles, Ohio	1400	1400 kw, RF
Steel Mill	California	1500	3000 kva, conduction†
Weirton Steel Company‡	Weirton, W. Va.	1300	1200 kw, RF
Weirton Steel Company	Weirton, W. Va.	1300	1200 kw, RF
Weirton Steel Company	Weirton, W. Va.	2100	2400 kw, RF
Weirton Steel Company	Weirton, W. Va.	2100	2400 kw, RF
Youngstown Sheet & Tube Company	Indiana Harbor, Ind.	600	600 kw, RF
Youngstown Sheet & Tube Company	Indiana Harbor, Ind.	2100	2400 kw, RF†

†Not yet in operation. ‡Division of National Steel Corporation.

Several other electrolytic tinning lines have Westinghouse conduction or radio-frequency reflow heating equipment, but line drives of another manufacture.



World's fastest tinning lines are Westinghouse-equipped

Engineering for electrolytic tinning lines is the most demanding in a steel plant, and Westinghouse pioneering in this field dates back to early attempts to deposit tin electrolytically on steel strip. Westinghouse has supplied all the electric line drive and tin reflow equipment for the higher speed horizontal acid type lines, and is now building equipment for the highest speed, vertical acid type.

The fastest tinning lines have as many as 150 individual d-c motor drives. Combining these drives, the generators that supply power to them, the 12 to 15 operators' stations, and the 100-foot-long controller into a coordinated drive system requires the kind of engineering and manufacturing talent Westinghouse can give you.

Reflow equipment, electro-cleaning and chemical treatment generators, switchgear, and numerous individual a-c motor drives and controls for pumps, scrubbers, welders and machinery adjustments must also be integrated into the system.

From planning to design, installation and start-up . . . Westinghouse brings decades of experience to you. A Westinghouse team will accept unit responsibility, and work with your engineering staff and consulting engineers in setting up your tinning line.

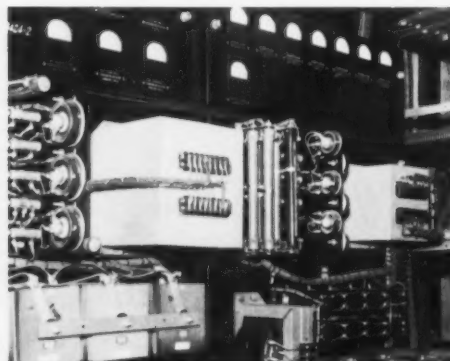
Contact your Westinghouse sales office for further details. Ask for a copy of B-6072, *Westinghouse Drives for Processing Lines*. Or write, Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pennsylvania.

YOU CAN BE SURE...IF IT'S

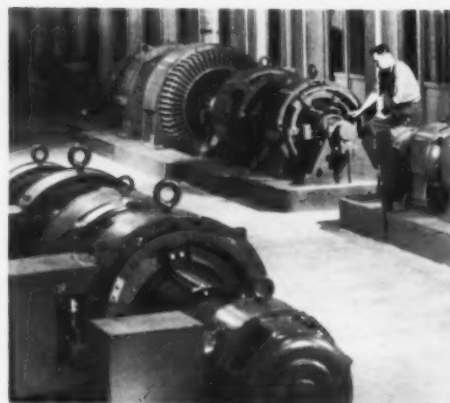
Westinghouse



Westinghouse d-c motors withstand tough treatment because Bondite® and Bondar® insulations have twice the life expectancy of ordinary insulation. This means longer service from drive system, as well as the motors. *Trade-Mark



Magamp regulators have no moving parts, brushes, commutators, bearings . . . bring outstanding precision, dependability to line drive control.



Westinghouse large motor-generator sets are built with Thermalastic® insulation which provides 20% greater dielectric strength, 10 times greater voltage endurance, 30 times greater tensile strength than ordinary insulation.

UNITED[®]



*6 stand continuous horizontal
and vertical Billet Mill*



UNITED ENGINEERING AND FOUNDRY COMPANY
Pittsburgh, Pennsylvania

Plants at PITTSBURGH • VANDERGRIFF • YOUNGSTOWN • CANTON • WILMINGTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER III—Lustrous, Corrosion-Resistant Finishing with Chemical Polishing Iridite

WHAT IS IRIDITE?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are widely accepted throughout industry as an economical means of providing corrosion protection, a good base for paint and decorative finishes for non-ferrous metals. Certain of these coatings also possess chemical polishing abilities that have luster-producing, as well as corrosion-inhibiting, effects on zinc and cadmium plate, zinc die castings and copper alloys. However, continued developments in this field have been so rapid that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this discussion of the many ways in which this chemical polishing characteristic can be used in final finishing or pre-plating treatments to produce a lustrous appearance with distinct display and sales appeal and appreciable savings in cost. Report I on decorative, corrosion-resistant finishes and Report II on paint base corrosion resistant finishes are available on request.

The degree of luster possible on a surface is a function of the degree to which the surface can be smoothed. Leveling to provide a smooth surface can be achieved by mechanical or chemical means, or a combination of these, depending upon the luster desired and the original condition of the metal. Chemical polishing effectively imparts luster otherwise difficult and costly to obtain. For this reason, it is often used to supplement or entirely replace mechanical polishing, depending upon the application and the original condition of the metal. Chemical polishing has the additional advantage of providing overall treatment of the submerged part. It reaches into even the deepest corners and recesses that are otherwise inaccessible. Certain of the Iridites are specifically designed to perform this chemical polishing operation. Also, they provide corrosion protection as do all Iridites, thus may be used as a final finish or a pre-plating polish.

If Iridite is to be used as a final finish, in contrast to pre-plating treatment, the chromate conversion coating generated is allowed to remain, providing good corrosion resistance. Color inherent in these Iridite films ranges from a yellow cast to yellow iridescent. These coatings may be used without further treatment where this color is acceptable and good corrosion resistance is desired. Further, these basic coatings can be tinted by dyeing. Among the dye tints available are shades of red, yellow, blue and green. If desirable, the basic coatings can also be modified by a bleach dip leaving a clear bright or blue iridescent finish. In all cases bleaching reduces corrosion resistance.

As examples of this type of final finishing, Iridites #4-73 and #4-75 (Cast Zinc-Brite) make possible for the first time, lustrous chemical polishing of the as-cast surface of zinc die castings. Thus, in many cases, sizeable savings in finishing cost are realized by elimination of plating costs. This economical method can be used on tools, appliance parts, toy pistols, locks and many other small castings. Another example is the treatment of copper and brass parts, such as welding tips, to eliminate buffing and provide additional corrosion resistance. In many cases, handling costs are reduced appreciably by replacing piece-part handling with bulk processing. Still another example of the use of this chemical polishing and protective quality of Iridite is a simple system of zinc plate, Iridite and clear lacquer instead of more costly electroplated finishes. Typical of this type of lustrous finish are builders hardware and wire goods.

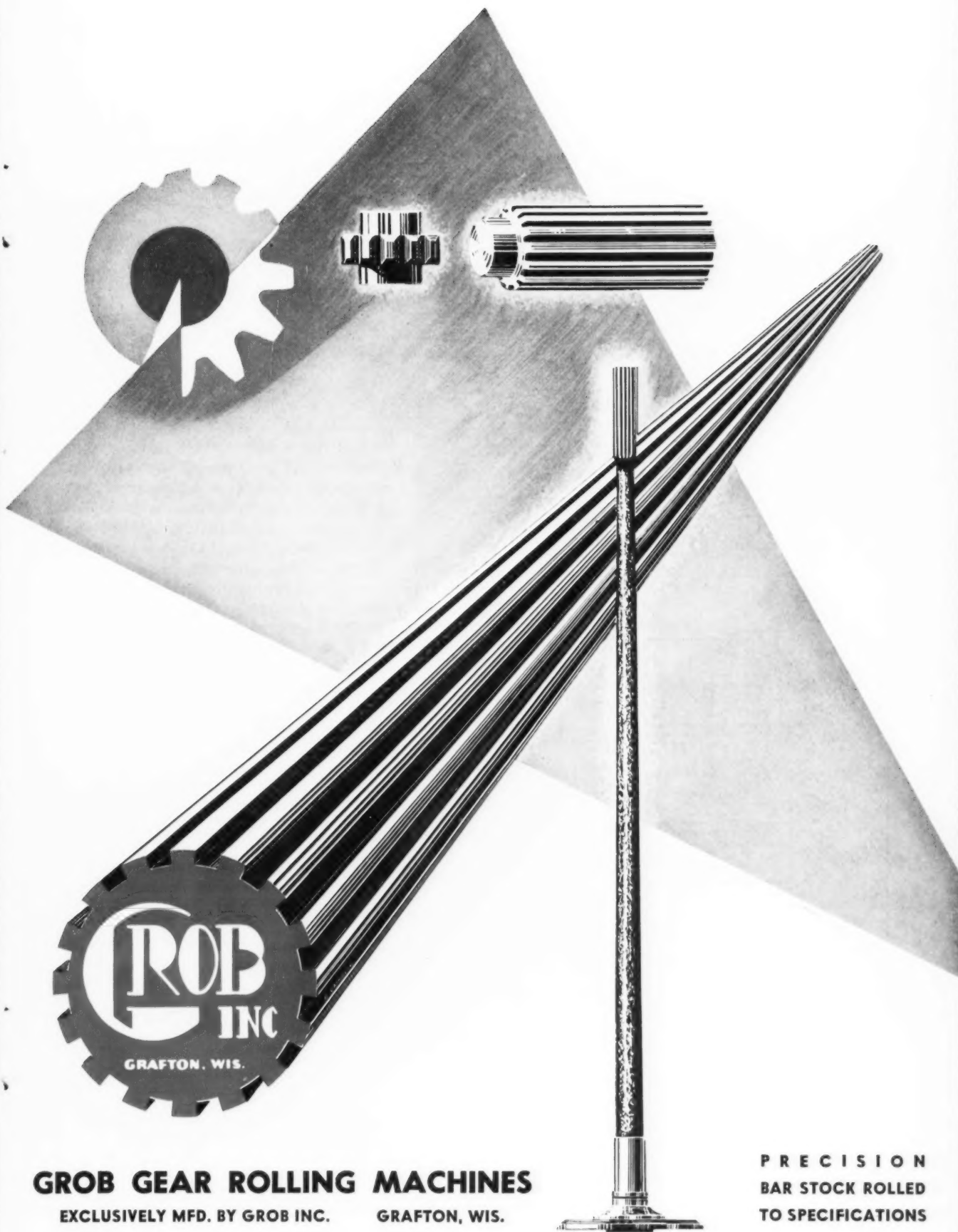
As a pre-plating treatment, in contrast to final finishes, Iridite can be used to chemically polish zinc die castings or copper prior to plating. In such cases, Iridite should be applied as an in-process step, so that the protective film is removed before the plating cycle. The savings in hand-

ling, material and labor costs are obvious. This process has made it practical to plate chrome directly over copper on steel, conserving nickel, yet producing a lustrous chrome finish. Used after stripping faulty plate in reprocessing zinc die castings, Iridite restores luster to the casting, thus making possible replating without blistering.

Other Iridite finishes are available to produce maximum corrosion resistance, a wide variety of decorative finishes and excellent bases for paint on all commercial forms of the more commonly used non-ferrous metals. As a final finish, appearance ranges from clear bright to olive drab and brown and many films can be bleached or dyed. As a paint base Iridite provides excellent initial and retentive paint adhesion and a self-healing property which protects bare metal if exposed by scratching. Iridites have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of their top performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product demands the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.



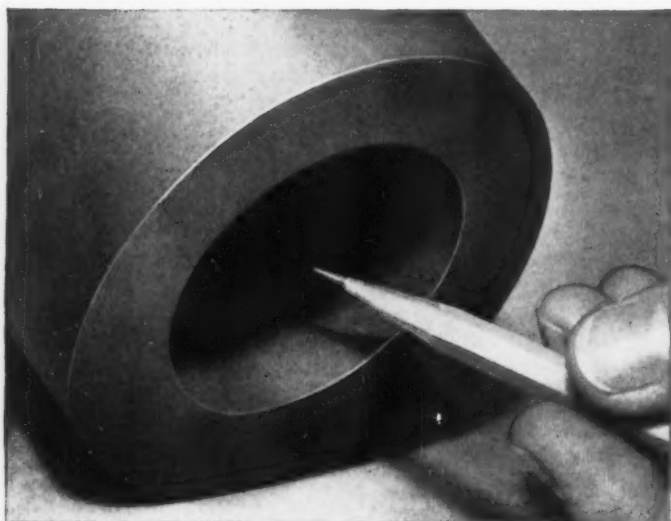
GROB GEAR ROLLING MACHINES

EXCLUSIVELY MFD. BY GROB INC.

GRAFTON, WIS.

PRECISION
BAR STOCK ROLLED
TO SPECIFICATIONS

SPEED PRODUCTION, CUT WASTE WHEN MAKING RING-SHAPED TOOL STEEL PARTS



New Graph-Mo® Hollow-Bar eliminates drilling, machines 30% faster

IF you make ring-shaped tool steel parts, you'll find that you can speed production, cut waste, and save steel by using Graph-Mo® Hollow-Bar. That's because Graph-Mo Hollow-Bar comes with the hole already in it. There's no drilling. You start with finish boring.

And with Graph-Mo Hollow-Bar you get the combination of proved advantages that have made Graph-Mo one of the most popular tool steels: excellent machinability, exceptional wearability, unsurpassed stability.

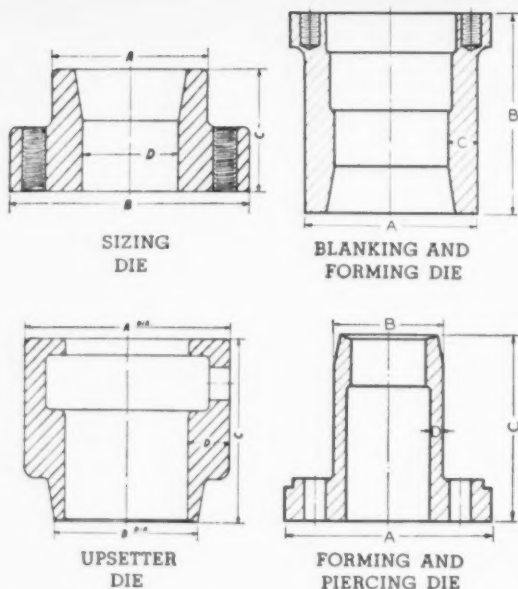
Actual tests prove that Graph-Mo machines 30% faster than other tool steels. That's because Graph-Mo has free graphite in its structure. And this free graphite gives Graph-Mo less tendency to pick up, scuff, and gall.

Graph-Mo's amazing wear resistance stems from a combination of graphite and diamond-hard carbides. Reports from users indicate that Graph-Mo outwears other tool steels on an average of three to one.

Graph-Mo also is the most stable tool steel ever made. A master plug gage made from this steel showed less than ten millionths of an inch dimensional change after 12 years in use. And Graph-Mo responds uniformly to heat treatment, too.

Makers of ring-shaped tool steel parts may obtain Graph-Mo Hollow-Bar in sizes from 4 to 16 inches O.D. with various wall thicknesses.

To learn more about Graph-Mo Hollow-Bar, and its application to your problems, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



TIMKEN *Fine Alloy* STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



Cleaver-Brooks of Milwaukee, Wisconsin, expands its manufacturing facilities and broadens its service capacity with the location of this new plant in Lebanon, Pennsylvania

THERE MUST BE A REASON...

*Cleaver-Brooks Company of Milwaukee built its new
50,000 sq. ft. packaged steam boiler plant*

IN PENNSYLVANIA



"Our company is the originator and largest producer of packaged boilers," says Mr. J. C. Cleaver, President, Cleaver-Brooks Company, "and for twenty-five years, we continued to make all our products in Wisconsin. When the continuing growth of our company made additional plant facilities necessary, we faced the important problem of choosing the most

advantageous location for their establishment. Our decision to locate our new plant in Lebanon, Pennsylvania, enables us to serve our concentrated Northeast Market better, at the same time improving our services for all our customers. Specific reasons which determined the selection of a Pennsylvania site were these:

1. "Proximity to sources of raw materials, such as steel plate and tubes.

2. "Availability of a working force possessing inherent industriousness and stability.
3. "Abundant and convenient industrial facilities, such as power, gas and water.
4. "A location that was not only close to the important Eastern Seaboard markets, but which was strategically situated to augment service to all our markets, all over the country."

Your company can benefit by these and similar advantages offered in many Pennsylvania communities. For free "Plant Location Services" booklet, or for details on how the PENNSYLVANIA PLAN can provide 100% financing for your new plant, write or call:

Pennsylvania Department of Commerce
Main Capitol Building, 569 State Street
Harrisburg, Pennsylvania
Phone: CEdar 4-2912

Special reports and tabulations, tailored to your specific location requirements, will be prepared upon request by engineering and economics specialists, covering:

Labor—Availability, skills, rates, surplus areas.

Markets—Consumer, industrial product, state, regional.

Transportation—Water, rail, truck, air transit time, costs.

Buildings—Availability, sizes, location, descriptions.

Sites—Acreage, topography, utility services, photos, maps; industrial districts.

Financing—Community-state industrial building program, lease-purchase, commercial credit.

Materials—Metals, industrial chemicals, wood, textiles, farm products.

Minerals—Location, reserves, potentials, analyses.

Water—Quantitative, qualitative analyses.

Power—Capacity, network, industrial services, costs.

Fuel—Coal, oil, natural gas service, costs.

Engineering—Schools, enrollment, specialization, research laboratories, services.

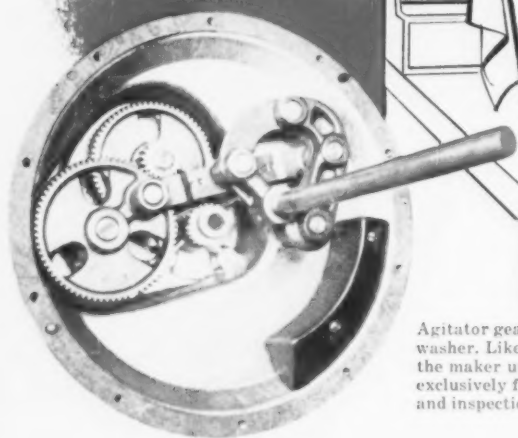
Taxes—Inter-state and community comparisons, assessment ratios, millages, corporate.

Communities—Characteristics, size, regions, housing, schools, culture, recreation.

Industrial Representatives Available for Inspection Tours, Conferences and Consultations

GEARED

to make
"Monday morning"
a breeze!



Agitator gears for a famous automatic washer. Like many other companies, the maker uses Fellows equipment exclusively for gear cutting, shaving and inspection.



Consider that modern marvel, the washing machine! It may handle *unbalanced* loads of 75-pounds of clothes and water...but it keeps working efficiently and quietly day after day, year after year. Yet it costs so little nearly everyone can own one.

The use of gears cut on Fellows Gear Shapers is one of the important factors contributing to the long-time, trouble-free service today's washers give. These gears must be of high quality

and production cost must be low. Many makers of washers and other major appliances meet these requirements for accuracy and economy by cutting their gears—and other shapes—on modern Fellows Production Equipment.

Your own gear cutting needs, from 1/16" to 120" P.D., can probably be met more profitably and efficiently with Fellows Gear Production and Inspection equipment. Why not get full information? Write, wire, or phone any Fellows office.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont

Branch Offices:

1048 North Woodward Ave., Royal Oak, Mich.
150 West Pleasant Ave., Maywood, N.J.
5835 West North Avenue, Chicago 39
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THE
PRECISION
LINE

Fellows

Gear Production Equipment



"BUFFALO" NO. 22 DRILL HELPS DISTRIBUTOR MAKE UP DIE SETS THE DAY THEY'RE ORDERED

Beals, McCarthy & Rogers, prominent steel and industrial supplies firm, makes up any of 987 die sets the same day a customer orders! To render this unique and speedy service, BM&R set up an extensive parts stockroom and completely equipped shop in its Buffalo, N. Y. warehouse. Their machines permit a rapid, accurate sequence of drilling, tapping, honing and other machining operations.

For the exacting work of drilling and tapping up to $1\frac{1}{4}$ " holes in punch and die holders, BM&R selected this "Buffalo" No. 22 Drill. Reasons for the choice: (1) adequate, smooth power for this high-capacity work; (2) full rigidity and strength for long life and accuracy; (3) easy operation and adjustments — as easy as with small sensitive drills; and (4) the precision ball bearing spindle which makes "Buffalo" Drills so reliable. Too, BM&R knows "Buffalo" quality and workmanship first-hand. They've sold the wide "Buffalo" line of drills for many years, and have seen these machines perform in hundreds of shops served by BM&R.

For the best drilling value and lowest drilling cost in your shop, make it "Buffalo", the choice of leading shops for 80 years.



BUFFALO FORGE COMPANY

492 Broadway, Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



DRILLING

PUNCHING

SHEARING

BENDING

Another first to help widen the scope of welding



Opens up new standards of speed and economy in welding mild steel

Here's the first all-position class 6010 electrode ever made with an iron powder coating. X-Ray and physical properties of the new Easyarc 10 are excellent. Outstanding characteristics for all-position welding with the inherent advantages of an iron powder coating. For a free sample of the new Easyarc 10, contact your nearest Airco Office.

welding
AT THE FRONTIERS OF PROGRESS YOU'LL FIND...



Offices and dealers in most principal cities

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated, New York 17, N. Y.

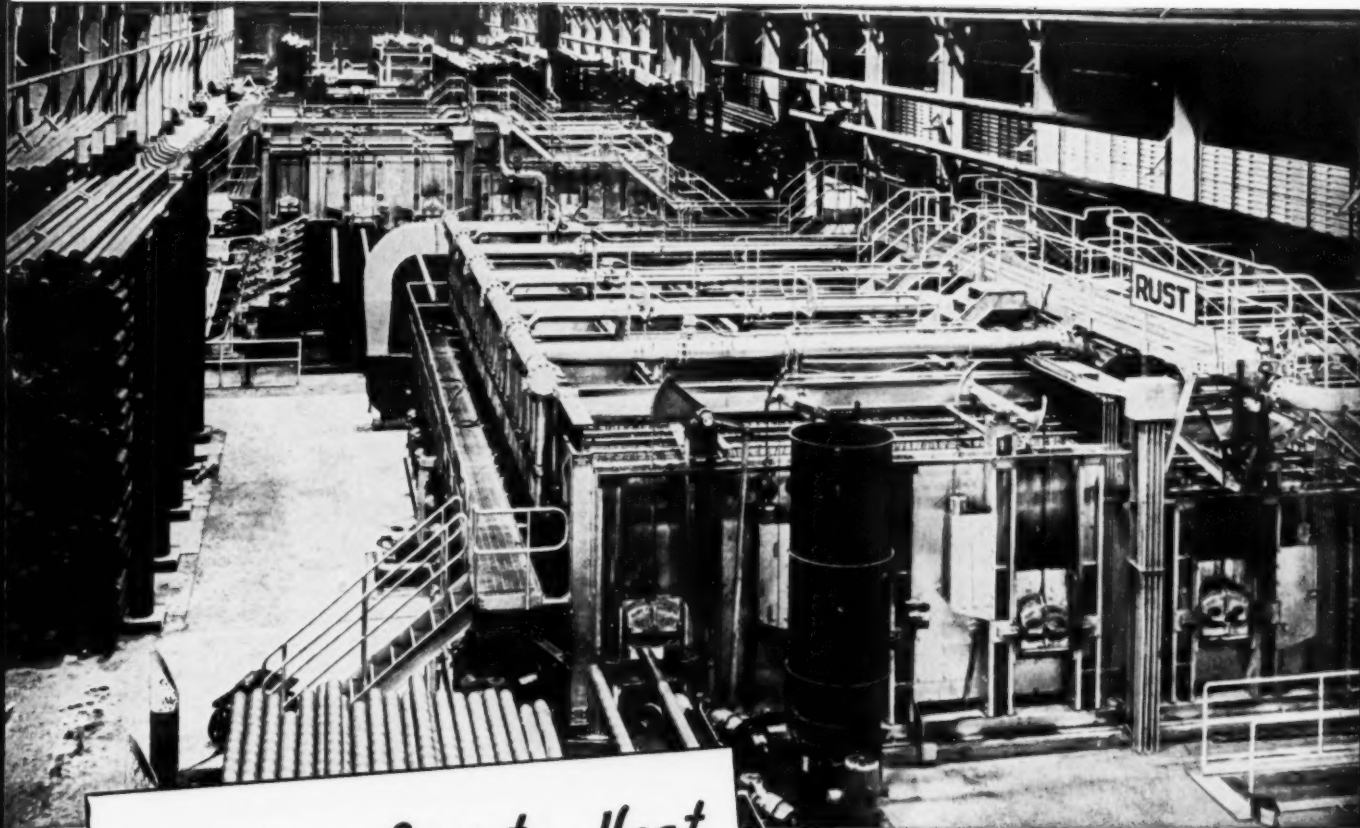
VISIT OUR
BOOTH 334



APRIL 9-11, 1957 - PHILADELPHIA, PA.

On the west coast —
Air Reduction Pacific Company
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In Cuba —
Cuban Air Products Corporation
In Canada —
Air Reduction Canada Limited

THE IRON AGE, April 4, 1957



*116 Tons Less to Heat
in this roof*

Here's another case where light weight means lower cost. The roof of this walking beam furnace is 2,320 square feet. B&W Insulating Firebrick suspended construction for a 9-inch roof weighs about 30 lbs per square foot, including the weight of rods, hangers, pipe, brick and mortar. This is approximately 100 lbs per square foot less than an arch constructed of heavy firebrick plus insulation having the same heat flow. *This saving means the B&W IFB roof is 116 tons lighter.*

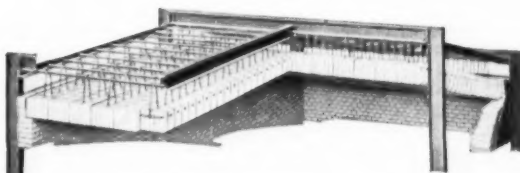
Here are the money-saving benefits of B&W suspended construction:

1. Supporting steel is less massive, far less costly. Commercial size steel can be used for roof suspension instead of special castings.
2. B&W Insulating Firebrick heat up and cool down faster. This means lower fuel costs, faster inspection.
3. Furnace temperatures can be changed quickly. When different steels call for different heating schedules, the furnace temperature can be adjusted in minutes instead of hours.
4. Installation costs are lower because these lightweight brick can be handled faster and easier than ordinary heavy firebrick.

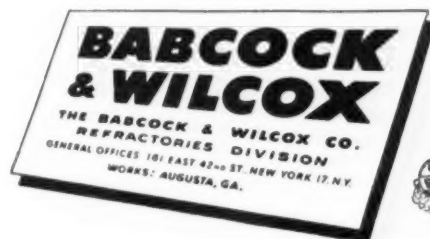
For complete information on B&W IFB—the *lightest* weight insulating firebrick, write to B&W today or call your local Refractories Engineer.

because of B&W Insulating Firebrick suspended construction

The new walking beam furnace (shown in photograph above) was designed and constructed by Rust Furnace Company for Jones & Laughlin Steel Corporation. Seamless pipe is conveyed into the furnace, moves slowly from left to right on walking beam rails designed and furnished by York-Gillespie Mfg. Co., and passes out the exit door.



This is a cross-sectional drawing of a typical suspended arch arrangement using B&W Insulating Firebrick. It can be used in flat or sloping roofs, nose arches and many other types of suspended furnace construction.





12"x 2" Disc or 200"x 132"x 2" Plate

**... Carlson is your ONE source for ALL
stainless steel components**

STAINLESS STEEL PLATES • PLATE PRODUCTS • HEADS • RINGS

YOU CAN RESERVE AIR FREIGHT SPACE



Check your drawings and you may find that you require all of the stainless steel items shown here—plates, heads, tube sheets, discs, forgings, flanges, rings, special patterns, bars, and sheets (#1 Finish) in the heavier gauges. When you buy all these material components from one source you save time, effort and money.

Your assembly costs are kept to a minimum when you use Carlson's abrasive cut material. Cleaner edges mean less true-up time on the job. There is no heat-affected zone because little heat is developed during the cutting. Fabrication is easier and the finished product is of the highest quality, more dependable in use.

Who pays freight on "offcuts" you can't use? No one, when you use Carlson's service for cutting plate to shape, ready for your fabrication. Plate is sheared, sawed, flame or abrasive cut and machined to your specifications. Eliminating freight charges on excess material lowers your costs.

There's the matter of delivery which also means time and money to you. As specialists in stainless steels, Carlson has the diversified equipment and the technical and practical knowledge to produce the plate or shapes you want, the way you want them with delivery as promised.

Stainless Steels Exclusively
CARLSON *Inc.*
 THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

DISCS • FORGINGS • FLANGES • BARS AND SHEETS (No. 1 Finish)

THE IRON AGE, April 4, 1957

25

CLEVELAND SPECIAL HEADED AND THREADED PRODUCTS

YOU CAN RESERVE AIR FREIGHT SPACE ON ANY FLIGHT IN THIS TIMETABLE

On United, you can reserve Air Freight space the same way you reserve passenger space—and on any of 900 daily flights!

The same United timetable you use to get places quickly and comfortably can be used to schedule large or small Air Freight shipments (from pounds to tons).

Air Freight moves on *all* United flights. And United will reserve space for your shipment on whatever flight you select.

This is called "Reserved Air Freight." It's United's way of handling Air Freight shipments with all the speed, frequency and schedule dependability of regular passenger service. In fact, United will even pick up and deliver your shipment.

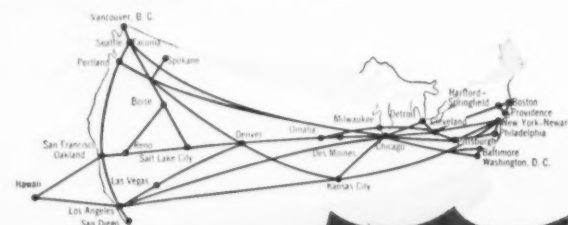
To guarantee the space you need on the flight you want, you simply call United's local Air Freight office three hours or more before flight time. They'll clear and hold the space for you.

No other airline does so much to make shipping so fast, so easy, so dependable. And at rates you'll find pleasantly surprising.

Examples of United's Air Freight rates

	per 100 pounds*
CHICAGO to CLEVELAND	\$4.78
NEW YORK to DETROIT	5.90
DENVER to OMAHA	6.42
SEATTLE to LOS ANGELES	9.80
PHILADELPHIA to PORTLAND	24.15
SAN FRANCISCO to BOSTON	27.00

*These are the rates for many commodities. They are often lower for larger shipments. Rates shown are for information only, are subject to change, and do not include the 3% federal tax on domestic shipments.



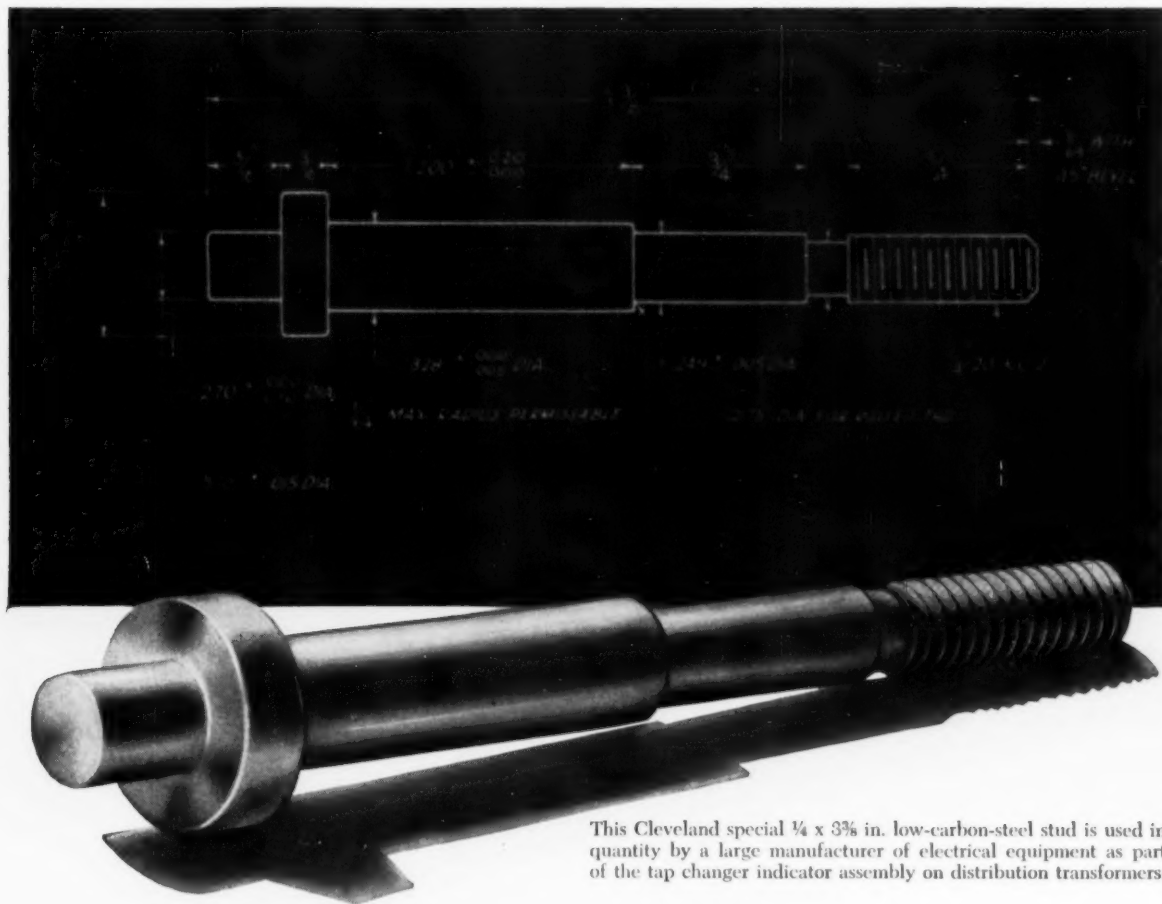
Door-to-door service

SHIP FAST... SHIP SURE... SHIP EASY



For service, information, or free Air Freight booklet, call the nearest United Air Lines Representative or write Cargo Sales Division, United Air Lines, 36 South Wabash Avenue, Chicago 3, Illinois.

CLEVELAND SPECIAL HEADED AND THREADED PRODUCTS



This Cleveland special $\frac{1}{4}$ x 3 in. low-carbon-steel stud is used in quantity by a large manufacturer of electrical equipment as part of the tap changer indicator assembly on distribution transformers.

Cost of special collar stud is cut 20% by Cleveland's cold forming techniques

The famous Kaufman Double Extrusion Process which turns out millions of Cleveland precision cap screws yearly is highly adaptable to low-cost production of your fastener-type specials.

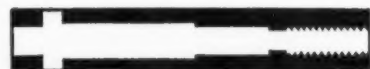
The tap changer stud pictured above is typical. Used by a well-known electrical equipment manufacturer, it was previously cut from

bar stock. The special head, double shoulders, and groove above the threads meant numerous machining operations and considerable scrap.

Cleveland now cold forms this special stud at 20% less cost to the customer, while holding the specified .005 in. tolerance. And the part is stronger. In the head, threads and fillets, grain flow is symmetrical and unbroken. In addition, the forging action of the Kaufman process toughens surface metal while

leaving the core ductile. Both fatigue resistance and tensile strength are thus increased.

We are regularly cold forming close-tolerance specials—many with unusual or extreme upsets—in large quantities. So whether your part is simple or complex, it will pay you to check with Cleveland, particularly at the design stage. There is an excellent chance that through cold forming we can cut the cost and improve the physical properties of the part you have in mind.



Black area represents metal that had to be cut away when stud was produced by machining. In the Cleveland cold forming process almost all the metal in the working slug is present in the finished part. The customer saves the difference.



Write for a copy of our folder "Specials by Specialists"

THE CLEVELAND CAP SCREW COMPANY
4444-1 Lee Road, Cleveland 28, Ohio

VS-100

**new all-electric
machine tool
feed drive**

No pick-off gears or gear changes are necessary with the VS-100. Infinitely variable 100 to 1 speed range offers high speeds for rapid traverse as well as the slowest feed rates.

Feeds may be precisely selected and rapidly changed, even during a cut. The push button operator's station provides easy, instantaneous feed control. This remote station contains controls for start, stop, jog, reverse, and speed changing . . . ideal in pendant station mounting for maximum operator's convenience. Additional functions, such as automatic dwell and automatic feed programming are available for the operator's station.

The VS-100 operates from 220 or 440 volt, single phase, a-c. circuits. Seven sizes are available ranging from $\frac{1}{2}$ thru 4 horsepower. For complete details write for bulletin D-2501.

D-1640



RELIANCE  ELECTRIC
AND ENGINEERING COMPANY

DEPT. 24A, CLEVELAND 17, OHIO • CANADIAN DIVISION: WELLAND, ONTARIO
Sales Offices and Distributors in Principal Cities

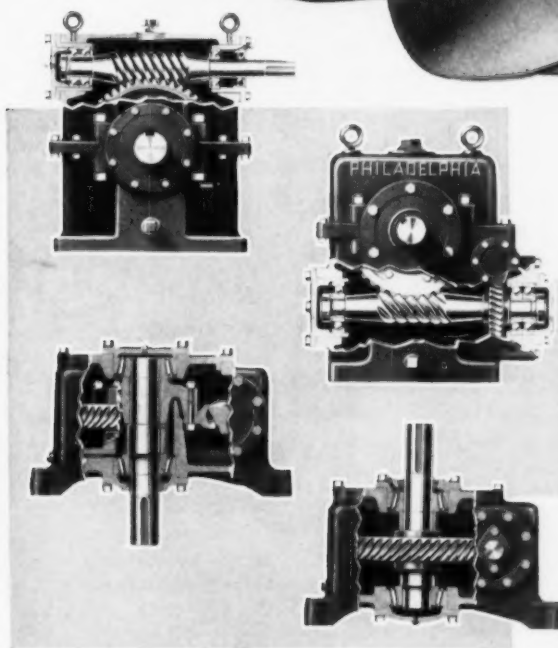


Here's where Worm Reducer Efficiency Begins

Because the service life and efficient operation of any Worm Gear Reducer depends upon the precise meshing of the worm and gear, we make every possible effort to assure that they are properly centered when the unit is assembled, and that the alignment will be permanent . . . Worms are of finest quality alloy steel with case hardened threads—shaft and threads being smoothly ground and polished after hardening. Worm gears for smaller size units are of solid chill cast nickel-bronze to meet AGMA specifications; while for larger size units the gear is made in two parts—the rim of chill cast nickel-bronze, bolted with fitted bolts and locknuts onto a semi-steel center.

The engineering skill and knowledge put into these features alone are indicative of their entire construction.

Scientific design, unexcelled workmanship, finest materials, rugged construction, noiseless and vibrationless operation, long-life and highest efficiency—are the "end results" that have earned an enviable reputation for Philadelphia Worm Reducers.



PHILADELPHIA WORM GEAR REDUCERS

A complete range of unit types and sizes to cover applications from $\frac{1}{4}$ to 265 H.P. Ratios from $3\frac{1}{2}$ to 1, to 6300 to 1. Our latest Catalog, WG-156, gives complete details . . . When requesting Catalog, please use your business letterhead.

phillie gear[®]

PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.

Offices in all Principal Cities

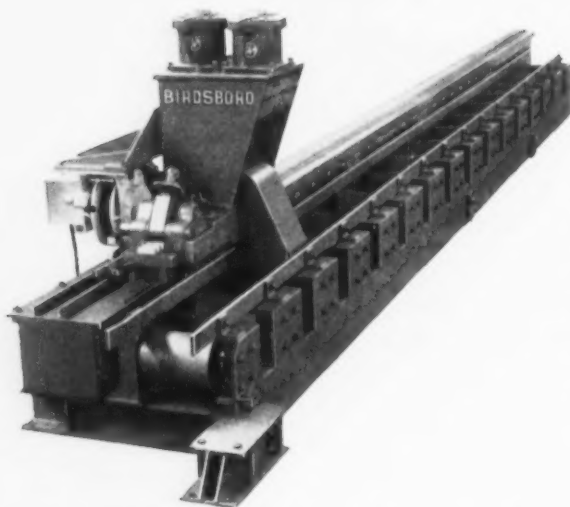
INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

Virginia Gear & Machine Corp. • Lynchburg, Va.



SHEAR GAUGE, also electrically positioned with solenoid operation of the gauge lift. It travels on an overhead gauge beam and the gauge table is equipped with a kick-off. Each kick-off arm is protected against breakage by spring loading.

Saw Gauge, Shear Gauge – Combining **BIRDSBORO** and CUSTOMER Ideas



SAW GAUGE, electrically positioned with solenoid operation of the gauge lift. The unit travels on a low beam and rack on top of the table lineshaft girder. The gauge head is spring cushioned. It is manually locked after positioning. This design is relatively compact and simple, and is suitable for lower tonnage operations.

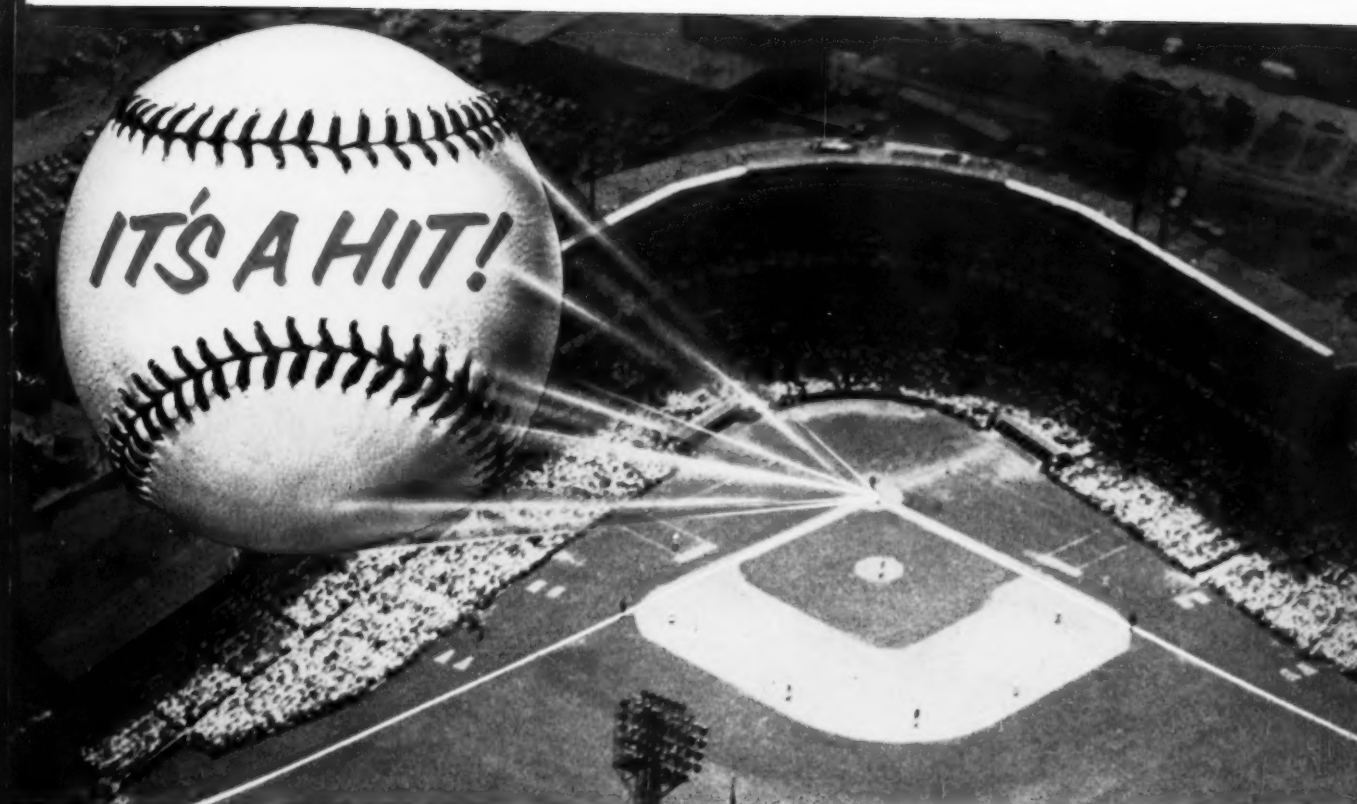
• The saw and shear gauges pictured here are designed to perform the same operation, each in a different manner. Each machine turned out by Birdsboro is the combined result of the ideas of the buyer and the ideas and design skills of the builder. For an exchange of ideas on your mill equipment problems, contact Birdsboro Steel Foundry and Machine Co., Birdsboro, Pa., District Office: Pittsburgh, Pa., Subsidiary: Engineering Supervision Co., 120 W. 42nd St., New York 36, N. Y.

BM57-57

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES (Metalworking and Extrusion) • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



How to **IMPROVE** your production **BATTING AVERAGE**

You'll lead the league when you switch to CIMCOOL[®], the radically new and different cutting fluid. Here are three ways that CIMCOOL Standard Concentrate can improve your production batting average:

- **CIMCOOL LOWERS COST** because it's longer lasting in machines. Thus, it reduces downtime and cuts labor costs for cleaning and changing.
- **CIMCOOL IMPROVES TOOL LIFE** because of its chemical lubricity. It permits faster speeds and feeds, for it combines friction reduction and cooling capacity in a degree never before attained by old-fashioned coolants.
- **CIMCOOL IS CLEAN**, doesn't soil clothing or hands. It contains no skin irritants. It leaves no slippery film on shoes, floors, machine or work. It can't smoke, can't burn, and virtually eliminates rancidity and foul odors.

For full details on CIMCOOL Standard Concentrate—and on the entire family of CIMCOOL Cutting Fluids—just contact us. Wire, write or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

*Trade Mark Reg. U.S. Pat. Off.

CIMCOOL CUTTING FLUIDS

CIMCOOL Concentrate—The famous pink fluid which still covers 85% of all metal cutting jobs. Effective, economical and clean.

CIMCOOL Tapping Compound—Permits the use of highest tapping speeds and increases tap life amazingly.

CIMPLUS The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.

CIMCUT Concentrates — For jobs requiring oil-base cutting fluids. Added to mineral oils, they give economical mixes for higher speeds and feeds.

CIMCOOL Bactericide — The most effective agent yet developed to overcome rancidity and foul odors.

CIMCOOL Machine Cleaner — The two-phase non-corrosive cleaner that removes grit, dirt, slime and oil.

CIMCOOL

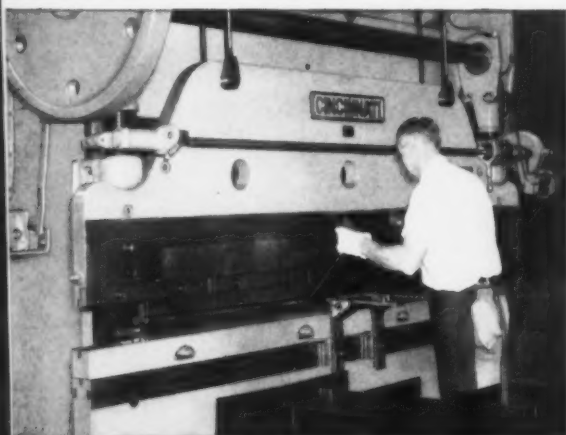
Cutting Fluids

for 100% of all metal cutting jobs

PRODUCTION-PROVED PRODUCTS OF THE CINCINNATI MILLING MACHINE CO.

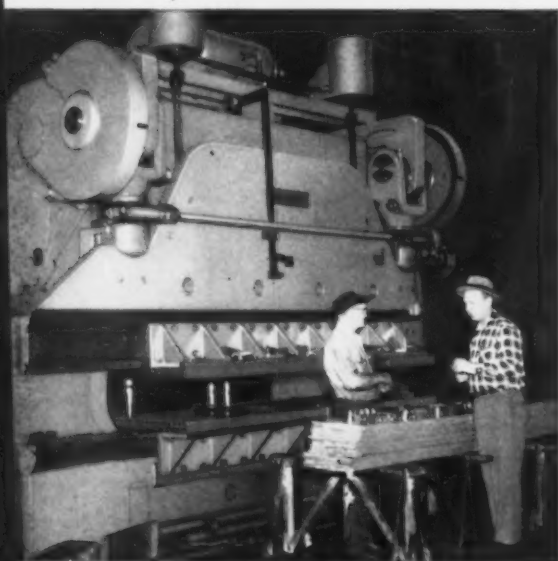
Punching and forming on accurate Cincinnati Press Brakes

... at NEW HOLLAND MACHINE CO., New Holland, Pa.



Tool boxes for New Holland Balers are shown being formed on this 8', 90 ton Cincinnati Press Brake.

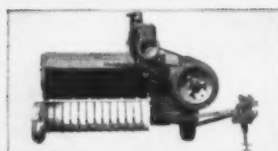
A setup for punching is shown being made on this 10' 335 ton capacity Cincinnati Press Brake.



Three Cincinnati Press Brakes are profitable producers in this finely equipped plant. Some of the standard features which contribute to the accuracy of these versatile machines are:

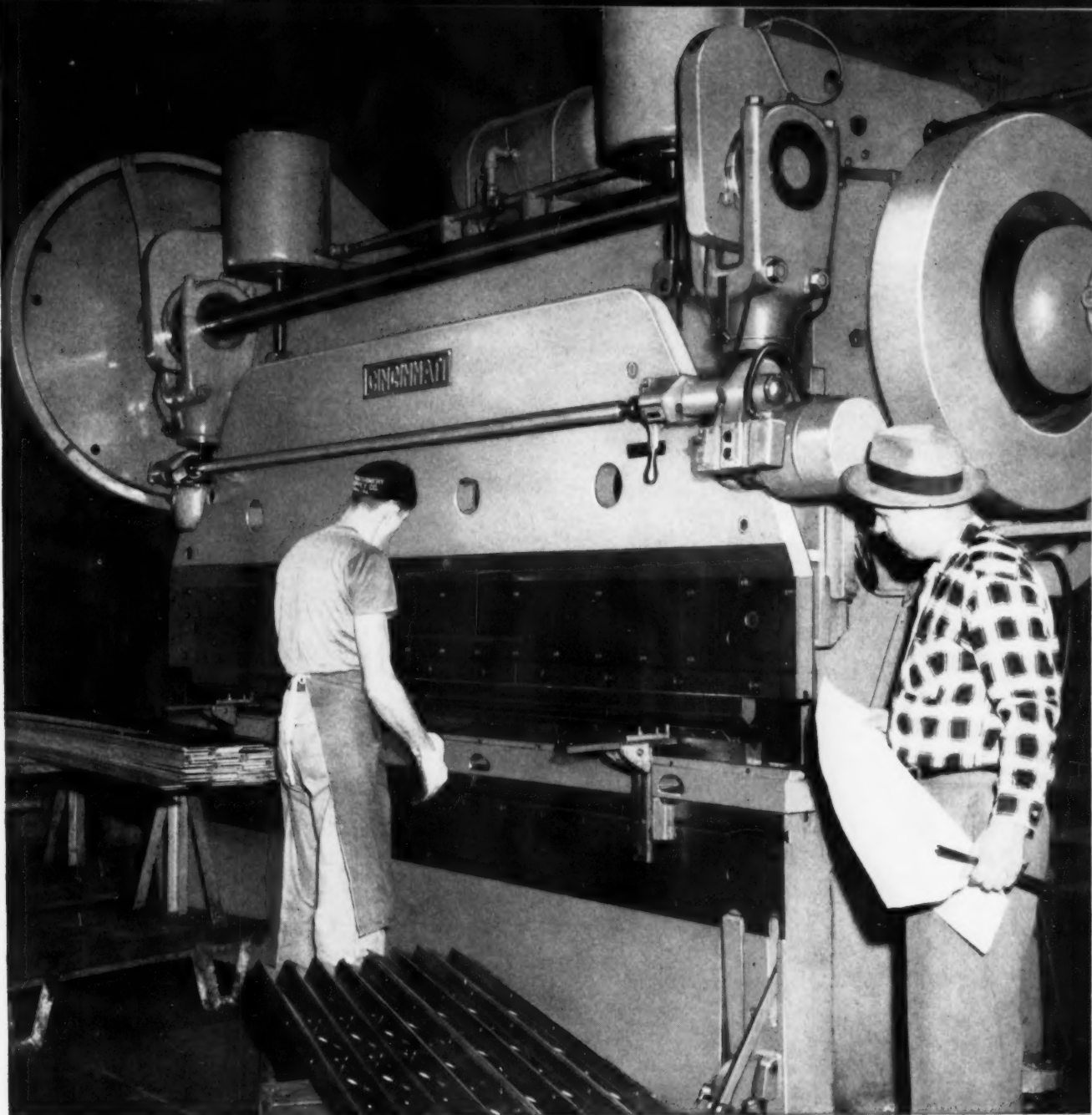
- All-steel interlocked construction (no welds used as load supports).
- Rigid, deep beds and rams insure accurate, uniform performance.
- Centerline loading eliminates weaving of frame and cramping of slides and guides.
- Tilting ram adjustment is useful for fade-out work—micrometer indicators make it easy to reset ram parallel to bed.
- Automatic pressure lubrication system insures proper oiling.

Write Department B for Catalog B-4R, and consult our Application Engineering Department about your production problems.



This Hayliner 68 Baler is just one of the many fine New Holland products made with the aid of Cincinnati Press Brakes.





This 10' Cincinnati Press Brake has a capacity of 150 tons, and is shown forming frame angles from $\frac{3}{4}$ " steel.

Photos courtesy of New Holland Machine Co., New Holland, Pa.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



Stainless Steel Gives Your



REPUBLIC



World's Widest Range of Standard Steels

Product a Competitive Edge



LOOK AT YOUR PRODUCT from the woman's angle. Sales success depends upon her acceptance. She wants a product that will keep its good looks—that is easy to clean and keep clean—that resists rust and corrosion—that doesn't tarnish—that is tough and strong to resist denting and scratching.

Republic ENDURO® Stainless Steel gives your product all of these advantages—plus eye and buy appeal. ENDURO, used for brightwork or as a functional part of the product, is an unmistakable sign of top quality that women recognize and appreciate. A quality that gives your product a competitive edge.

NOW LOOK AT YOUR PRODUCT from the production angle. You and your suppliers can fabricate ENDURO Stainless Steel on your present equipment without difficulty or major change in procedure. And remember, ENDURO requires no lacquering, plating or electro-chemical treatments to enhance its famed corrosion resistance and lasting beauty. Republic Metallurgists will help you choose the proper ENDURO types to add sales stimulus to your product. Mail the coupon.

HIGH STYLE AND HARMONY. Manufacturers of many major appliance items are skillfully using the lustrous beauty of ENDURO to complement and harmonize with other materials and finishes. It enhances the over-all design, yet does not compete for attention.



SAFE FOR FOOD OR THE FINEST FABRICS. Thousands of commercial applications have proved ENDURO safe for processing food and dairy products, for dyeing, bleaching and laundering the finest fabrics. ENDURO's smooth, hard, dense surface offers little foothold for contaminants or bacteria. Corrosion is locked out. These advantages are being applied to an ever increasing number of appliances and housewares. What about your product?

EASY TO CLEAN and keep clean. ENDURO is easily cleaned with a simple soap and water rinse. There's no applied surface to chip, flake or peel away. Nothing to tarnish or fade. Republic also supplies two other outstanding steel sheet products. Republic Continuous Galvanized, used for liners, etc., offers excellent ductility and a tight zinc coating. Republic Electro Paintlok, for housings and other parts, can undergo severe forming operations before painting and still retain its superior paint-adhering quality. Send coupon for facts.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION

Dept. C-3619
3104 East 45th Street
Cleveland 27, Ohio

- ☐ Have a Stainless Steel Metallurgist call.
Send more information on:
☐ ENDURO Stainless Steel ☐ Electro Paintlok® Sheets
☐ Continuous Galvanized Sheets

Name _____ Title _____
Company _____
Address _____
City _____ Zone _____ State _____

Less downtime...lower upkeep...

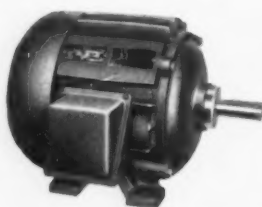
WITH

Wagner Protected Type Industrial Motors

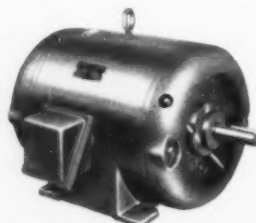
Wagner protected type motors lower your maintenance costs... cut down time, because they are designed for use where operating conditions demand EXTRA protection—for bearings or windings, against corrosive vapors or abrasive dirt, in explosive atmospheres or exposed outdoor locations.

Each of these Wagner Motors will give completely dependable performance in its specific application—with a minimum of maintenance. All these motors can be relubricated, when necessary, for longer bearing life.

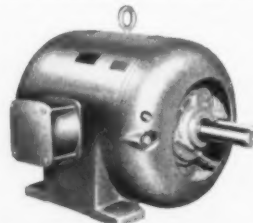
A Wagner field engineer, expert on motor applications, will be glad to help you choose the *right* motors for your specialized needs. Just call the nearest of our 32 branch offices, or write us for Bulletins on Wagner Industrial Motors.



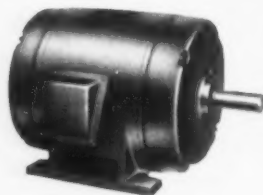
TYPE EP—Ribbed frame fan-cooled. New NEMA Frames. 1 to 30 hp.



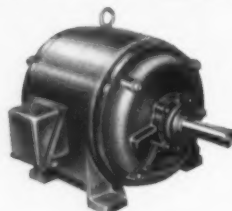
TYPE EP—Totally-enclosed fan-cooled. Corrosion-resistant frames. 40 to 250 hp.



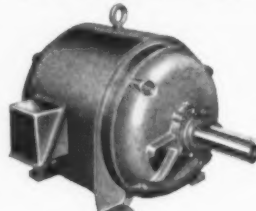
TYPE JP—Fan-cooled... Explosion-proof. Cast iron frames. 40 to 250 hp.



TYPE DP—Drip-proof... corrosion-resistant. New NEMA Frames. 1 to 30 hp.



TYPE DP—Drip-proof. Cast iron frames. 40 to 125 hp.



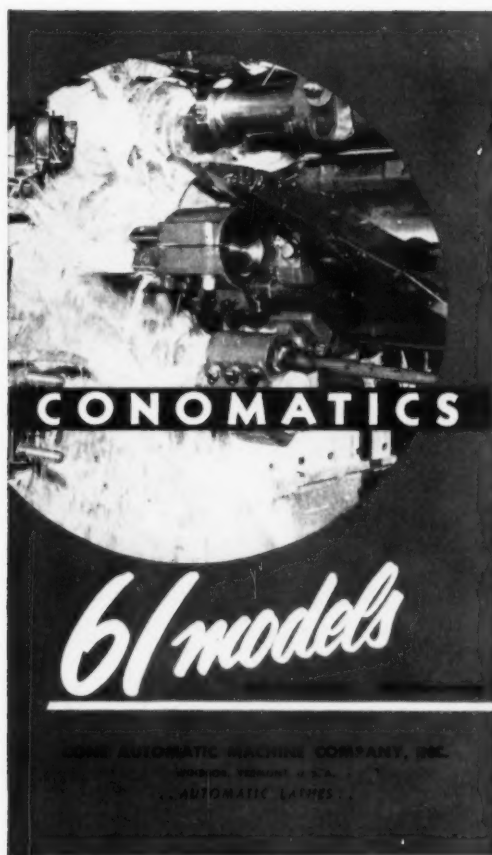
TYPE RP—Drip-proof. Fabricated steel frames. 125 to 500 hp.



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Wagner Electric Corporation
6403 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC



CONOMATICS

61 models

CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VERMONT, U.S.A.
...AUTOMATIC LATHES...



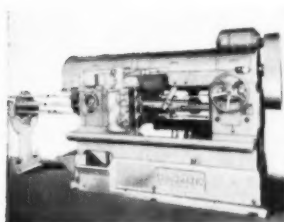
1-Spindle 2 1/2" thru 3"
3 sizes
4-Spindle 1 1/2" thru 2"
11 sizes
4-Spindle Non-Indexing
1" sizes — 1" thru 3"
6-Spindle 10 sizes
7" thru 8"
8-Spindle 6 sizes
1 1/2" thru 3"
6-Spindle & 8-Spindle
4 sizes — 1 1/2" thru 8"

61 models

A machine not put to its best use is theoretically idle. Proper machine selection is an important factor in the profitable use of a multiple spindle automatic. So extensive are the demands on this type of lathe that no single model—or number of models—can be expected to efficiently handle the wide range of work available.

To excel in any range of work a multiple spindle automatic must be specifically designed for that range. That is why CONOMATICS are provided in so many models. In no other way can the purchaser be assured of the best possible machine for his particular requirements.

Write for your copy Today

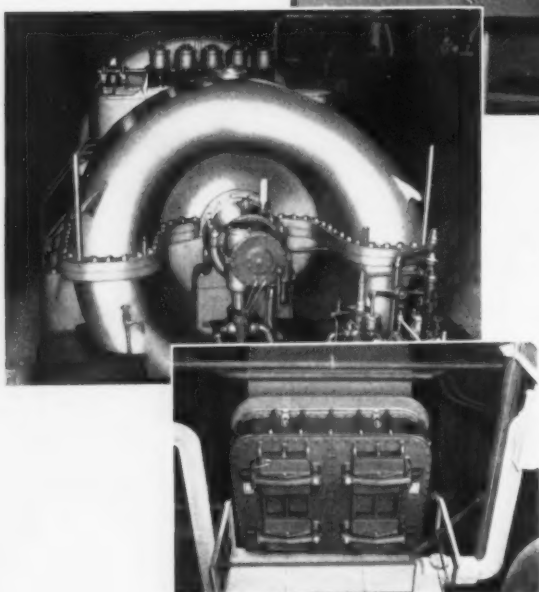
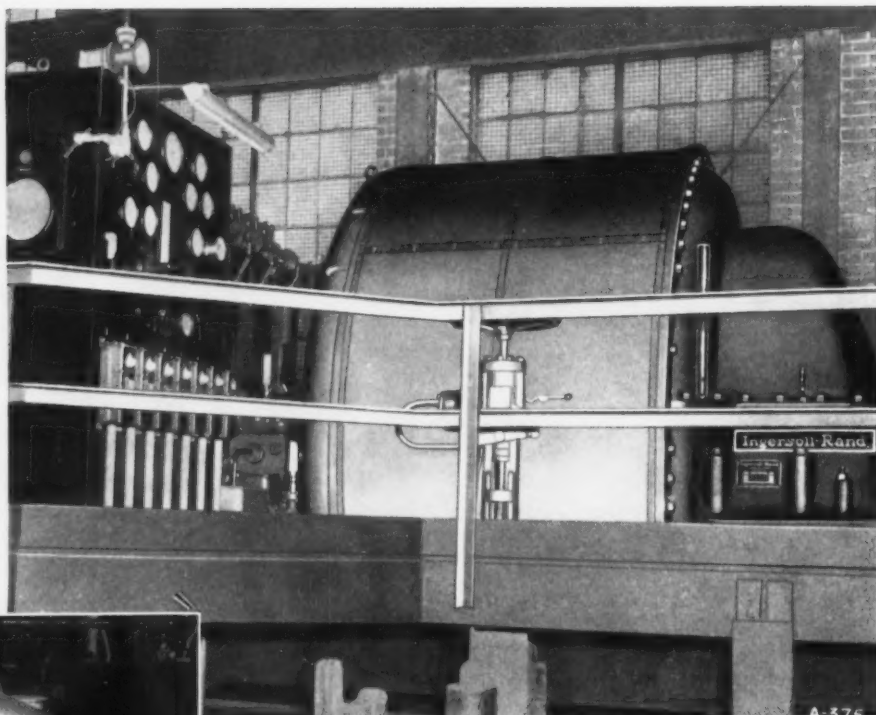


Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

Blower end of 110,000 cfm Turbo-Blower for Blast Furnace No. 2 at Portsmouth Steel Division of Detroit Steel Corporation.

Another view of the same Blower, showing 12,300-hp I-R steam turbine and (below), 10,000 sq. ft. vertically divided, two-pass I-R surface condenser.



3 huge I-R Turbo-Blowers

serve the blast furnaces

at

DETROIT STEEL'S

Portsmouth Division

All of the air for the blast furnaces at Detroit Steel's Portsmouth Division is supplied by three Ingersoll-Rand Turbo-Blowers.

The new 110,000 cfm Turbo-Blower for Blast Furnace No. 2 is driven by a 12,300-hp I-R steam turbine which is served by a 10,000 sq. ft. I-R surface condenser.

The two 50,000 cfm units, each powered by an I-R turbine, have been in continuous service for over 35 years, with an excellent record of trouble-free performance.

Other I-R equipment at Portsmouth includes ALV centrifugal pumps, Motor pumps, compressors and maintenance tools.

When it comes to steel mill equipment — compressors, blowers, condensers, pumps and air tools — Ingersoll-Rand's unequalled experience and facilities are at your service.

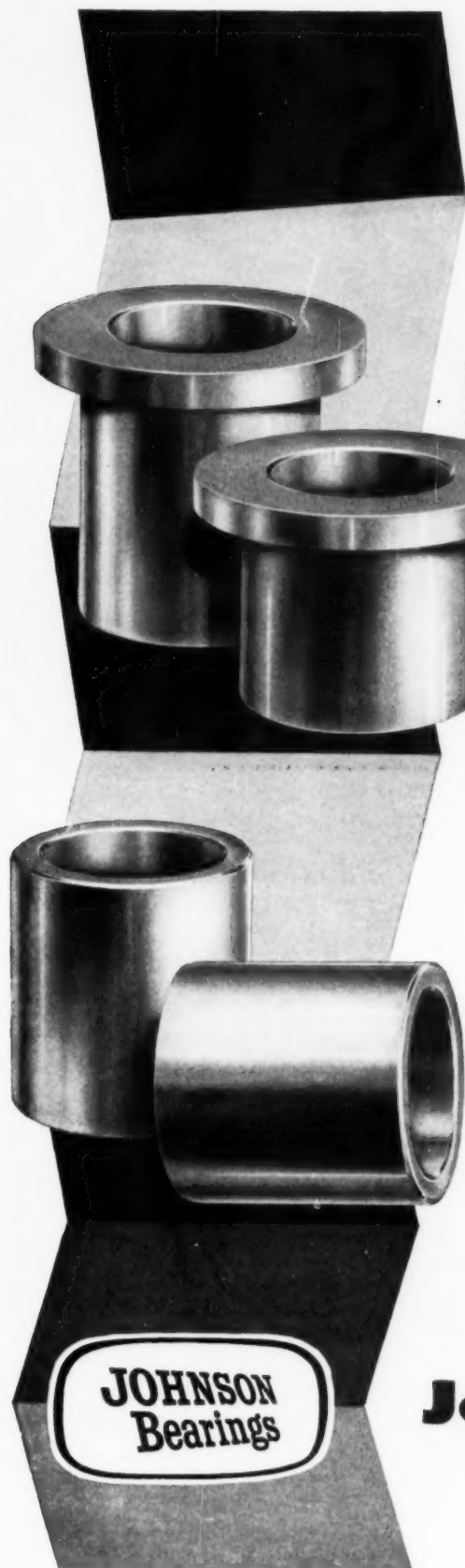
12-174



Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

COMPRESSORS • CONDENSERS • BLOWERS • PUMPS • ROCK DRILLS • AIR TOOLS • DIESEL AND GAS ENGINES



500 Stock Sizes of Ledaloyl Self-Lubricating Bearings

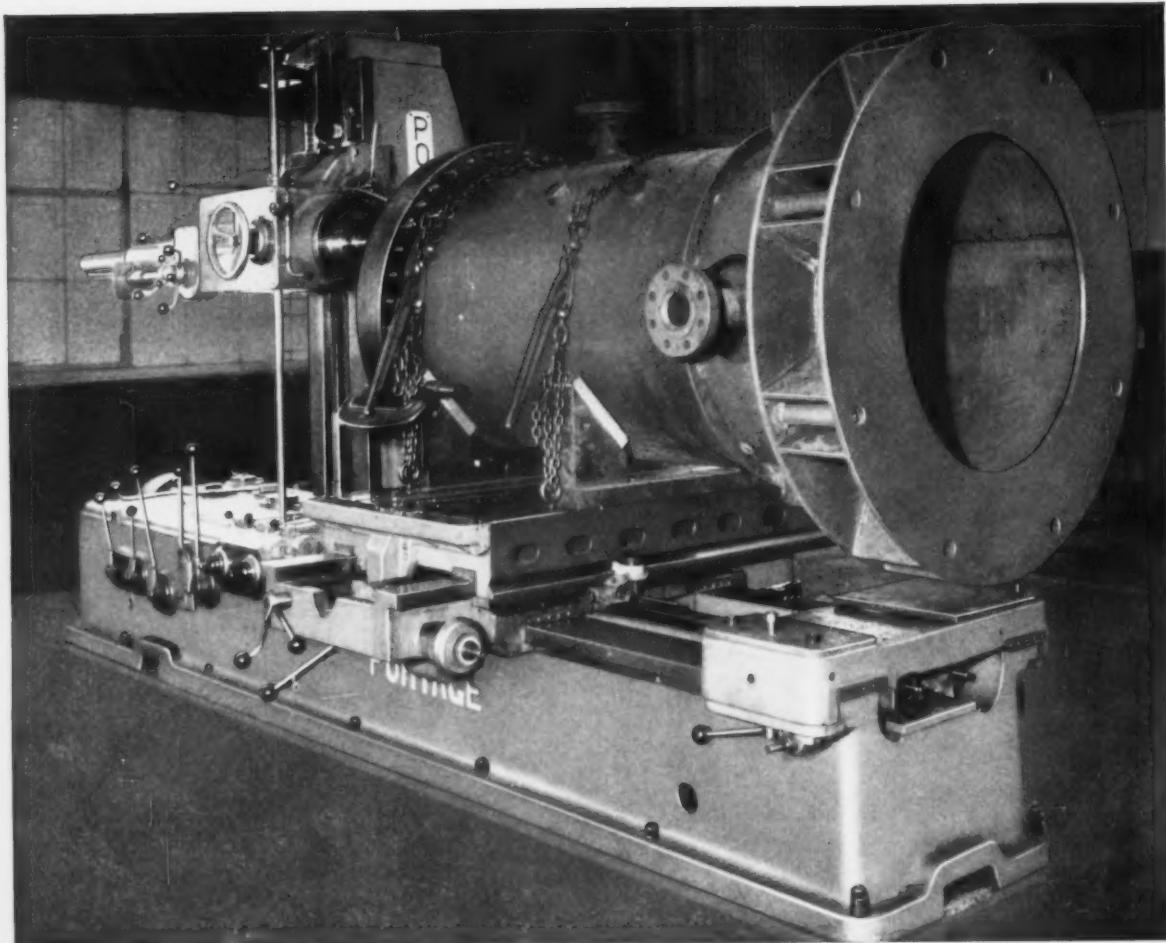
With stock Ledaloyl self-lubricating bearings you can enjoy the advantages of economy and quick delivery and still have a wide latitude in design. Plain cylindrical, flanged and spherical self-aligning types are available with various ID's, OD's and lengths. Engineers find that in many applications the standard composition and size tolerances are ideal for their products.

Johnson stock Ledaloyl bearings will function efficiently in hundreds of different applications. Oil is retained in the pores of the bearing and metered out to the shaft when it is in motion, eliminating the need for an expensive and bulky lubricating system. In many cases the bearing will provide adequate lubrication for the life of the product without adding to the original oil content.

If you are interested in obtaining complete details on the advantages of stock Ledaloyl self-lubricating bearings or any of the many other types of Johnson sleeve bearings consult your Johnson distributor or write for our catalog.

Johnson Bronze

505 South Mill Street, New Castle, Pa.



Photograph courtesy of Western Supply Company, Tulsa, Oklahoma

Read what this man has to say about **PORTAGE MILLS!**



Mr. D. W. Brady, Plant Manager of Western Supply Company, Tulsa, Oklahoma says,

"Our manufacturing facilities here at Western are devoted almost entirely to heat exchanger production. We have found the versatility of the Portage Mills allows us to do a wide variety of machining operations required in the fabrication of this type of work. We have found the machine to be very reliable and have experienced no lost time for repairs since it was installed."

Mr. Brady's kind remarks are typical of those coming in from across the country... PORTAGE MILLS are truly the *machine of the year*... and remember... Portage costs less to buy. Write for the illustrated catalog... and ask for a proposal too!



THE *Portage* MACHINE CO.

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Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

Highest Quality Ferroalloys

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OTHER SPECIALTY ALLOYS

High quality ferroalloys are produced in the electric furnaces at Beverly and Jackson, Ohio, plants. Close metallurgical control results in uniform high quality day after day, month after month.

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A highly competent staff of metallurgical engineers is available for consultation. We welcome your inquiry.

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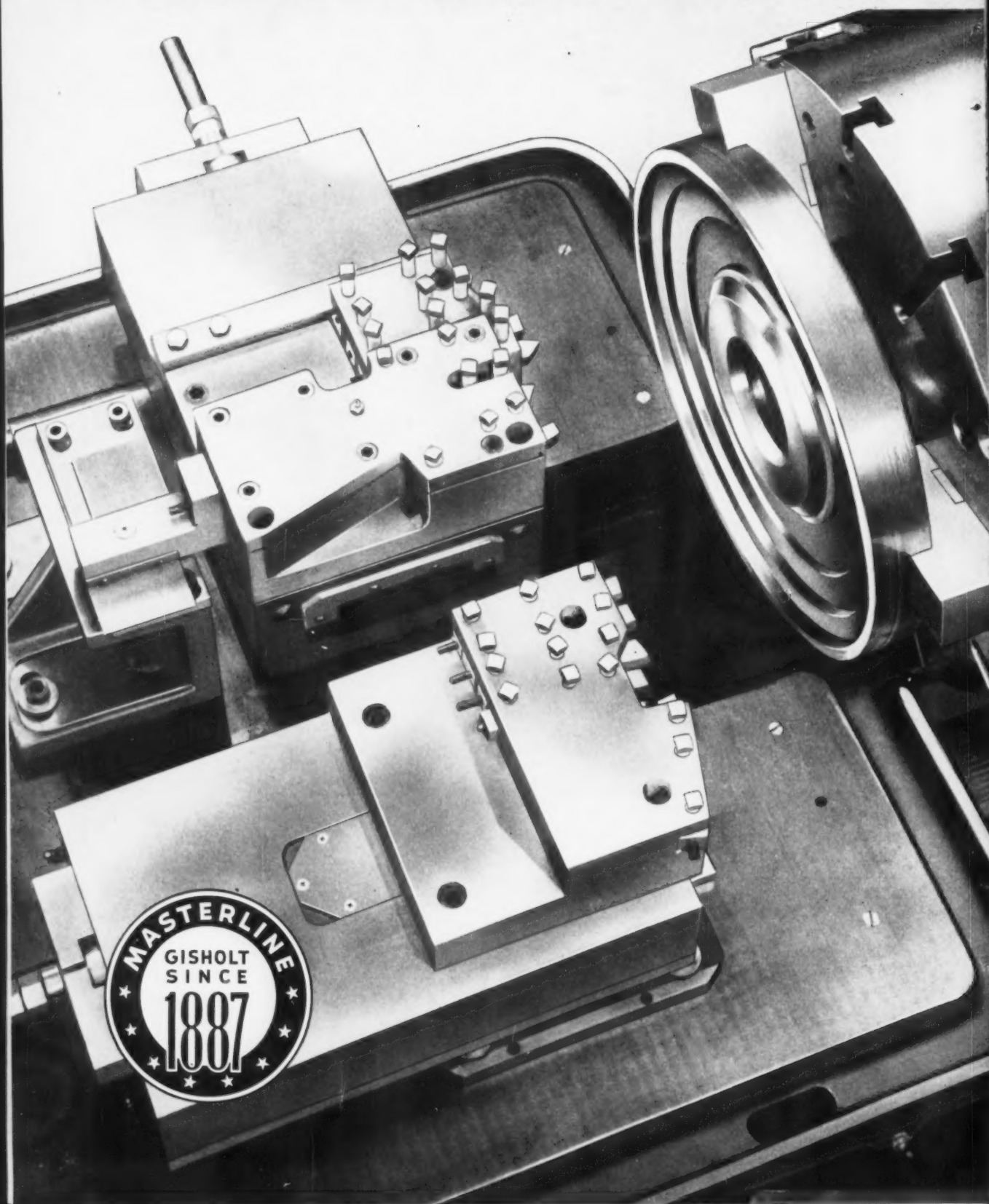
IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS

Tapping a heat at the Beverly, Ohio, plant

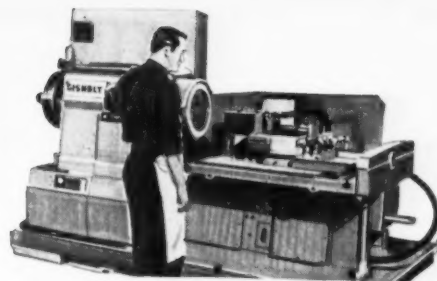


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This New GISHOLT MASTERLINE
SIMPLIMATIC AUTOMATIC LATHE may save you



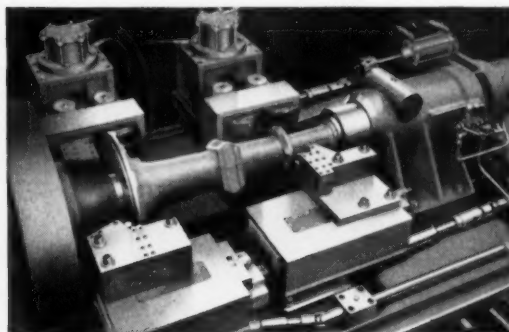
the cost of a special machine



HERE'S WHY: the machine itself—headstock, bed, extra wide platen table—is *standard*!

Yet with the new Gisholt MASTERLINE Simplimatic Automatic Lathe, you have ample space for an *infinite* number of slide and tool arrangements. You can use front, center, rear and auxiliary slides—all moving at different feed rates—carrying enough tools to machine a maximum number of surfaces in a single chucking. All slides are easily mounted at correct angle to the work—keeping tool overhang to absolute minimum for increased rigidity and increased accuracy. And with the Simplimatic's table feed, tools can engage with the work or perform additional machining operations before actual slide movements begin.

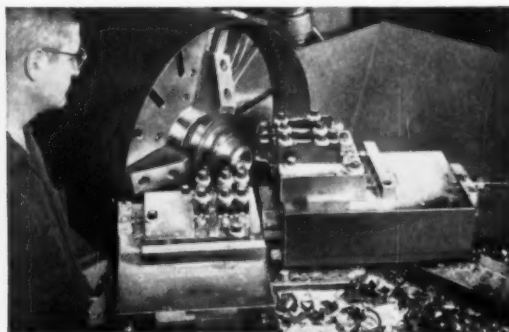
Simplimatic setup for machining both ends of tractor rear axle housings in one chucking. Four tool slides are used, two at the front and two at the rear of the platen table. Machining includes turning and chamfering, forming and straddle-facing, with tool relief provided for facing tools on the rear tool blocks.



Because the Gisholt Simplimatic is a standard machine, it is *easy* to set up, operate and maintain. In many cases, the automatic cycle frees the operator to handle additional units or perform other work. And the basic design is readily adapted for work-handling devices, which even further simplify the operator's job and speed production!

Ask your Gisholt Representative to show you how efficiently the Simplimatic can handle your problem parts—using a simple, standard machine transformed by addition of standard tool slides, tool blocks and chucking equipment—performing *special* machine functions at *standard* machine prices! Call him today for full information on the Simplimatic!

Six different sizes of tough steel oil well cutter bits are handled with ease and efficiency by this tooling setup. All slides and tools are placed at correct angle to the work. Tools are mounted on riser plates, permitting pre-setting for quick change-over and adjustment. Rigid support eliminates chatter on heavy forming cuts.



READY NOW! Write today for new Catalog 1159-A on Gisholt MASTERLINE Simplimatic Automatic Lathe. Fully illustrated—shows 31 typical jobs.



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What's more, Roebling Royal Blue is *stronger* than the strongest wire rope previously available. It will do more work and last longer on *your* job. Call your distributor or your nearest Roebling office for full information about Royal Blue, the really better wire rope. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING  

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How Rollpin cuts assembly costs

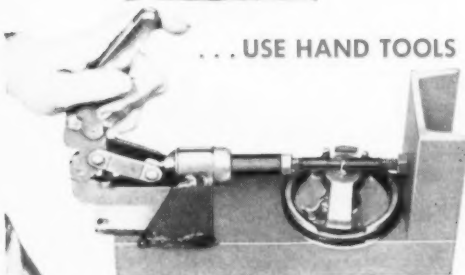
by matching the insertion method to the assembly problem



HAMMER IT IN ...

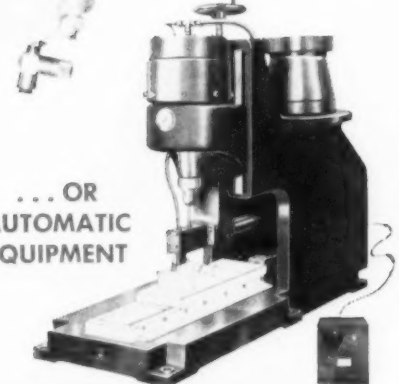


... USE HAND TOOLS



... POWER TOOLS

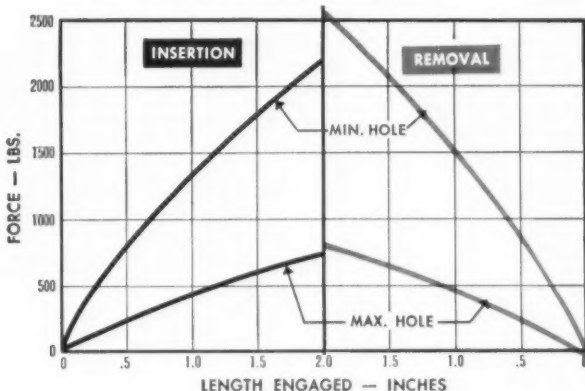
... OR AUTOMATIC EQUIPMENT



It's as easy to insert a Rollpin® as it looks. And it's fast any way you do it. You can use a hammer, hand tool, power tool or automatic equipment. Insertion cost is less because no precision drilling or reaming or secondary locking operations are required. A hole drilled to normal production standards will do.

Rollpin is a slotted, chamfered, cylindrical spring pin. It locks securely in place—and can be drifted out and reused over and over again. Rollpin replaces taper pins, straight pins and set screws; for many applications it will serve as a rivet, dowel, hinge pin, cotter pin or stop pin.

TYPICAL INSERTION AND REMOVAL FORCES IN STEEL FOR .250" DIAMETER ROLLPIN



WHY ROLLPIN IS SELF-LOCKING. Here is graphic evidence of the forces that make Rollpin a truly self-locking spring type fastener that will remain tight under vibration until deliberately removed.

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Dept. R45-477, 2330 Vauxhall Road, Union, New Jersey

Please send me the following:

- ☐ Rollpin installation data ☐ Here is a drawing of our fastening problem. What insertion method would you suggest?

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____



got a problem?

If it concerns *special steels*, bring it to Crucible — where experienced steelmen make mountains into molehills.

And whether your needs run to pounds or tons of special steels, your orders get prompt, dependable service — at any of Crucible's conveniently located warehouses.

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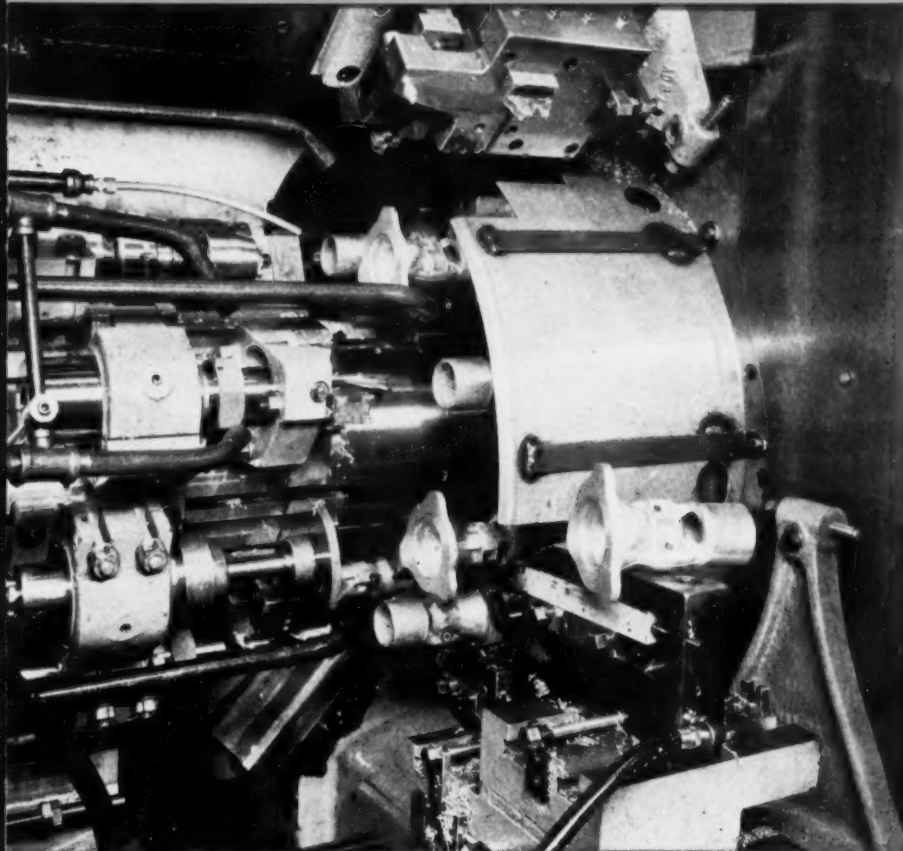
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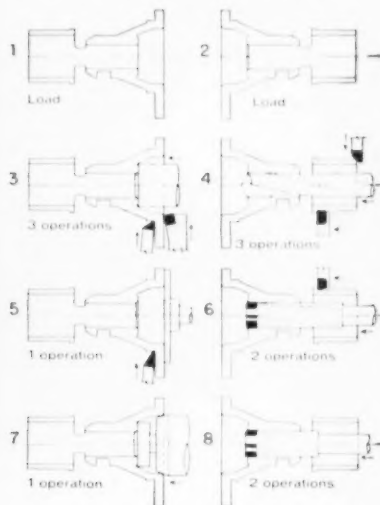
Acme-Gridley

RPA-8 SPINDLE CHUCKER

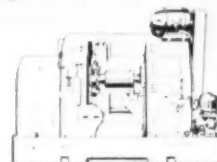


**BASKET HUB
ALUMINUM DIE CASTING**

Double indexing—both ends completed at one setup on 6" RPA-8 Acme-Gridley Chucking Automatic.



12 operations in 13 seconds



SPEEDS PRODUCTION . . . eliminates special machine investment

When it became necessary to replace the special machine on which this washing machine basket hub had been produced, the production engineer chose an Acme-Gridley eight spindle chucker. His choice was based on two factors: lower initial investment than that required by the special machine; greater adaptability of the Acme-Gridley with proper tooling to handle many such jobs that otherwise would require special equipment.

Acme-Gridley 8-spindle automatic chucking machines give you maximum production at lowest cost per piece because of greater tooling flexibility, double indexing that permits finishing both ends of the piece at one time, and comprehensive tooling engineering that comes only from COMPLETE LINE experience.

Write today for
Bulletin Nos. CM-44 and CM-51A

**INDEX . . . to lower
machining costs...**



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CLEVELAND 8, OHIO

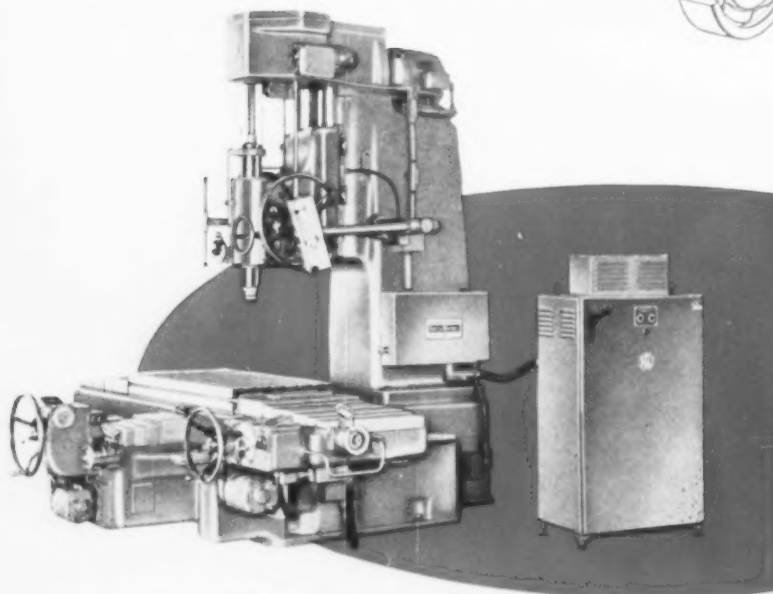
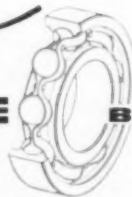
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FACTS

about

NEW DEPARTURE

BALL BEARINGS



3E Jig Borer—Courtesy Pratt & Whitney Co., Hartford, Conn.

INVESTMENT IN PRECISION

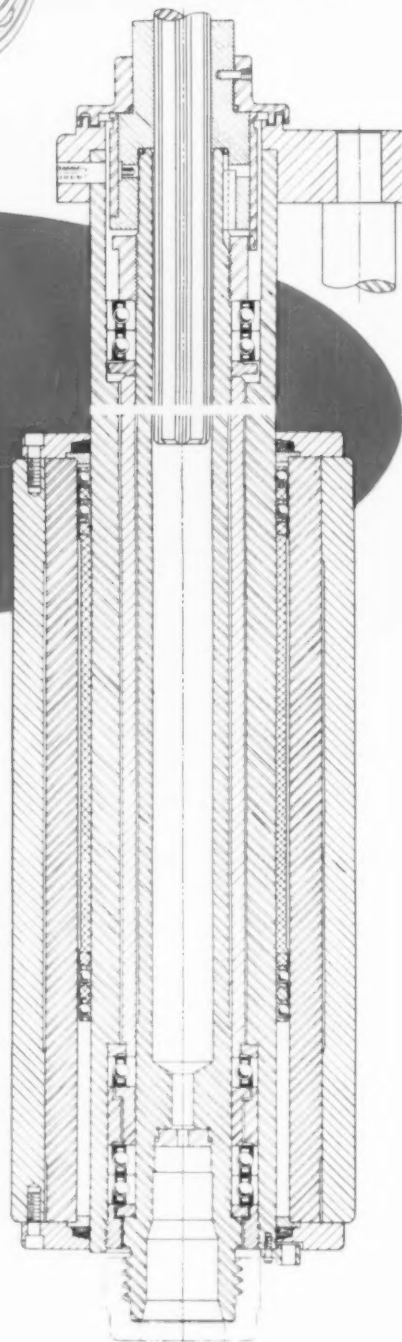
No finely built machine entrusted with cutting metal to extremely small tolerances can be any more precise than the bearings on which its major rotating parts depend.

That's why you'll find this exquisitely accurate Jig Borer Spindle is mounted on New Departure preloaded duplex ball bearings. These bearings assure *permanent precision* through a wide range of speeds and feeds.

As a further accuracy feature, the hardened, ground and lapped spindle quill moves on a large number of preloaded steel balls, thereby eliminating any clearances, however small, that would otherwise be required. For more details on New Departure preloaded duplex ball bearings, send for Catalog S.



New Departure Duplex ball bearings are available in a complete range of sizes and series and are made to the finest precision tolerances.



SEE "WIDE WIDE WORLD" SUNDAYS—NBC-TV

BALL BEARINGS MAKE GOOD PRODUCTS BETTER

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

Taking Another Look

New ore beneficiation techniques are encouraging steel men to take a second look at low grade ore deposits closer to their home bases of operation. Example is current heightened interest in north central Wisconsin. Several producers hold low-grade ore-bearing properties in the area.

Liquor Disposal Answer?

Now in the wind: A new approach to steel industry's million-dollar problem of pickling-line waste liquor disposal. Two phase process first reduces volume as much as one half; then continuously reconcentrates pickling acid in a four-tank cascade system. Pickle liquor draws off in a continuous process, the ferrosulfate is centrifuged out, and reconcentrated acid returns to pickling tanks. As interest quickens, it's expected process may become fully automatic, with 6-9 month tank-emptying intervals.

A-Engine Progress

Metal-cooled atomic engines may take the military research route into civilian industry. Further Navy tests on the sodium-cooled reactor from the submarine "Seawolf" could help civilian power producers. Navy likes compact, space-saving size; finds liquid metal circuit is excellent for removing heat from a small reactor.

Drawbacks Noted

Simplified engineering drawings are cutting costs at a growing number of companies. But some caution against overlooking hidden expense. If outside suppliers and vendors don't understand the drawing symbols used, a company can find design savings offset by increased construction costs. Some vendors refuse to work with simplified drawings, even with an explanatory code.

Speeding Road-Work

Electronic computers are shouldering more of the desk-type work in the national road improvement program. They're cutting away 90 pct of the time needed to figure tonnages of earth to be moved for new roadways; are trimming by 75

pct cost of finding the tonnage totals. They're easing grade and bridge planning and traffic-load studies. They're used, or on order, by 35 states.

Binders Up Core Strength

Recent foundry research indicates possible use of cheap organic binders to improve the green strength of CO₂-cured molds and cores. Among the binders already tried successfully are dextrin and water-soluble starch. The same test program shows that insufficient CO₂ gas pressures have a direct and harmful effect both on rate of chemical reaction and on mold strength.

Speeds Stove-Changing

Stove changing time for blast furnaces can be cut by as much as 8 minutes. Replacing conventional stove door with a burner shut-off valve turns the trick, one equipment supplier advises. Added suggestion: Use of power actuators on larger valves, or a full-automatic system, can cut time further.

Nitriding Mutation?

Making use of high-current glow discharge, a new process for "ionitriding" metals has been developed in West Germany. Object of the process: To provide a high degree of surface hardness on steels and other metals, thus increasing their resistance to wear and high temperatures. Though related to nitriding, the new process claims a number of advantages over the older method.

Toward Better Inspection

Development of lineal acceleration equipment for speeding up electrons promises to improve industrial inspection. Resulting high-energy electron flow penetrates deeply into metal parts, reveals hidden defects in much the same manner as X-rays. Industrial significance lies in short exposure times possible—often a matter of seconds for metal sections many inches deep.

Gages Ball Bearings

For ball bearings, a new automatic assembly machine automatically spits out and replaces parts outside specification limits, then completes the assembly. A unique feature is fact that the gaging equipment operates at a speed roughly twice that of the assembly equipment proper.



Spurgeon Automation Unit on the test floor of the Spurgeon Company at Van Dyke, Mich. Note the vital points where Cleveland's are installed—a small unit (20AT) driving the feed mechanism and two 70ND units, one at each end of the elevator lift.

Spurgeon automation unit employs three CLEVELANDS

IN a Detroit automotive plant, three Spurgeon units automatically elevate, transfer and feed steel bars into bar cut-off machines. Top production is gained and hours of man power and money are saved by automation.

Three Cleveland Worm Gear Speed Reducers are employed on each Spurgeon unit: Two vertical reducers on the mechanical drive that operates the elevator; a third Cleveland on the "V" Roll Conveyor pushes the rods into the bar cut-off machine.

Automation and Cleveland Worm Gear Speed Reducers go hand-in-hand. Precision matching of case-hardened steel worms to nickel-bronze gears insures 100% dependability. And, the compact, right-angle Cleveland design saves space and makes installation easy.

Find out what Cleveland can do for your operations before you buy. Catalog 400 gives the story. The Cleveland Worm and Gear Co., 3282 E. 80th St., Cleveland 4, O.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



CLEVELAND
Worm Gear
Speed Reducers

Washington is a veritable gold mine for the businessman who knows his way around — and has a good product to sell.

But there are tricks to every trade, and woe to the company that jumps into the Washington maelstrom without careful reconnaissance. The pitfalls have trapped big and small business alike.

Still, says H. Struve Hensel, the "tricks of the trade" are not what some people would have you believe. The smooth-talking influence peddler who claims to be on a first-name basis with legislators and Cabinet members will only

get you into trouble. Behind-the-scenes string-pulling is another dangerous pastime.

Personal acquaintance can be as helpful in Washington as in New York, Chicago, or San Francisco. But no more helpful. That's assuming that you are in a position to carry out the terms of your government contract; that you are competitive, and that you can produce a quality contract.

Mr. Hensel's advice to the would-be government contractor: (1) know your business thoroughly, (2) speak frankly, and (3) sell on the merits. Also: Watch your step!



At 55, H. Struve Hensel is a veteran of the Washington scene. His initiation came in war-time 1941 when he organized and headed up the procurement legal division of the Navy. This division handled all legal matters in procurement contracts.

Subsequent wartime service included tours as general counsel for the Navy and assistant secretary of the Navy.

After the war, Mr. Hensel served as general counsel, Dept. of Defense, and Asst. Sec. of Defense for International Security Affairs. He returned to private practice of law in 1955 on leaving the government.

How To Deal With Washington

It's a Job For The Experts

■ There is no reason for a businessman to approach his own Government with the tourist's lack of confidence on his first visit to a Middle Eastern bazaar. There are plenty of experienced guides available and a few guide lines will reveal a readily discernible pattern amidst the seeming confusion.

First, the Federal Government is the largest and most complicated administrative organization in the world. Its fantastic size and intricacy have been acquired largely in the last two and one-half decades. It still sprawls and creaks.

Second, its operations overlap and intertwine. Clear cut lines of vertical authority are impossible. The simplest project seems to involve several departments or agencies — and sometimes Congress.

The problems of coordination

faced by our largest industries with dozens of plants and subsidiaries are merely table models of the frustrating struggle in Government to get things done.

Third, particularly in the military services and to some extent everywhere, personnel at all levels change every few years. The military officers rotate regularly. The turnover in Presidential appointees would ruin a business. The civil service employees move around and leave for private enterprise.

The contracting officer who negotiates your contract seldom administers it, and almost never settles it. The need for a clear and incontrovertible paper record of actions, representations, changes, excuses and the like is absolute.

Continued P. 53

Should You Have a Washington Office?

If you are selling directly to the Government, you have probably wondered whether it would pay to establish a permanent Washington office. Here are some points to consider:

Will the expected sales volume and profits justify the expense? In making this decision, the Government should be regarded simply as another customer.

Intermittent trips from the head office to Washington cannot do the sales job with Government as well as a permanent set-up on the spot.

The Government needs more frequent contacts than any other customer. Calls must be made again and again.

The flow of information from a Washington office can be important economically. Research and new ideas in many fields focus in Washington. Intermittent trips from the home office can't do the job.

A successfully performed Government contract requires meticulous administration and expert supervision of each step of performance. Uncle Sam is anything but indulgent about defaults and losses.

If a Washington office is considered too expensive, thought should be given to a part-time agent with necessary abilities.



... And If So, Who Should Run It?

Says Mr. Hensel: "... In my opinion, a Washington office selling to the Government should be built around a company official. He should be familiar with the company's products and capabilities. And, while not necessarily an engineer, he should be experienced enough in these matters to discuss them generally and to know when he needs expert technical advice.

"Remember the business of the Washington office is to promote sales, and the Washington representative is the spearhead of that effort.

"The Washington office, even for large sales volumes, need not be a large one. The top man may need a stand-by assistant—but otherwise, his helpers will be mostly stenographers and clerks."

How Much Does U. S. Buy?



Defense: Every 24 hours, the Government pays out to military contractors, subcontractors, and for payroll more than \$100 million.

In the 12 months starting next July 1, Uncle Sam will spend about \$44 billion for military security at home and abroad. About one-third of this will be for purchase of military hardware — electronics equipment, machine tools, aircraft, ships, vehicles, guns, weapons, and guided missiles. Payroll accounts for half of defense spending.

General Services: General Services Administration, the Government's "housekeeper", spent in the 12-month period ending June 30, 1956: \$418 million for supplies, equipment, and services used by Federal agencies; \$34 million for ECA foreign aid supplies. In addition, \$198 million went for stockpile buying in the period ended June 30, 1956. Deliveries to the stockpile were \$312 million.



Atomic Energy: In the 12-month period ended June 30, 1956, the U. S. Atomic Energy Commission spent \$279 million for supplies and materials, and \$47 million for equipment.

For the fiscal year ending June 30, 1957, this spending will rise to



\$431 million for supplies and materials, and \$62 million for equipment. Estimates for 1958 are \$660 million for supplies, materials; \$89 million for equipment.

So much for some basic generalities. The fundamental question is: What should business do about Washington?

I. HOW TO DEAL DIRECT

All Roads Lead—If you aim for direct sales to the Government, these negotiations in most instances must start in Washington, although final negotiation and administration may take place elsewhere. Even in the cases where competitive bids are solicited and received outside Washington, the bidder's list is prepared in Washington and the program initiated in Washington. Above all, it will be a Government contract—and they are written and interpreted in Washington.

Things To Know—To make a sale or an intelligent bid to the Government, your representative should be able to read and understand the technical specifications. He should be able to compare his company's technical know-how, personnel and capacity with such specifications—and be able intelligently to discuss those matters. He should also appreciate the fiscal and accounting procedures required under Government contracts and know whether his company's accounting system is adequate.

Furthermore, there is more to a Government contract than getting it. Too many people think that once one signs up with the Government, the money is guaranteed and Uncle Sam, not being run for profit, will be indulgent about defaults and losses. Nothing could be farther from the truth.

It's Expensive — A successfully performed Government contract requires meticulous administration and expert supervision of each step of performance. This administrative vigilance is so vital that in spite of the political clamor of small businesses for Government contracts, I for one have serious doubts as to whether small business can afford the procedures and administrative

staffs required to do business directly with the Government.

Write It Down—Oral representations by Government contracting officers—so often relied upon in private transactions—are worthless in the face of fine print requiring all governmental representations and commitments to be in writing.

The Small Print—There are also change orders and delays in the approval of plans. Both cost money and can increase the estimated required working capital on the basis of a geometrical progression. The contracts provide that the Government will pay any increase in cost caused by a change order, but unless those increased costs are settled at the time of the order or the delay, the possibilities are legion for differences of opinion as to what costs were really increased.

In these instances, the Government has the money and the contractor has the burden—of cost and of proof. And remember the Government contracting officer at the end will probably be new and will know only what he can learn from the file.

Play It Safe—Protection against loss from change orders and delays demands continuous watchfulness by experienced technicians, accountants and lawyers. Small business frequently neglects this administrative supervision throughout the entire performance and is disagreeably surprised—and angry. Even big business suffers losses from oversight.

II. INDIRECT APPROACH

If your company does not plan direct sales to the Government, a somewhat different approach is practical. Your Washington representative need not have the same background of experience with the company as he would were you selling direct. Ex-Government officials and retired military officers can be used. Continuous legal and accounting advice is not essential.

Avoid "Contact" Men—In fact, unless the volume of work is large,

a full time representative will not be kept busy and consideration might well be given, even if large sales volumes are involved, to the retention of the part-time services of an independent agent in Washington. Even in this type of representation, a well-rounded man, with some technical knowledge and complete familiarity with the techniques of Government procurement, will be preferable to the "contact man" who relies on personal acquaintance and alleged political influence.

III. BIG PICTURE

Except in times of crisis when prices and materials are controlled and export and other licenses are required, few businessmen see the need for close contact with their Government and its programs. The impact of Government action on day-to-day business operations is ignored. Those matters are generally left to be taken care of by industrial and commercial associations or by seeing to it that the "right" political party is elected.

Deep Thinkers Needed—Yet the close and intimate relationship between Government and business has been with us for some time and will remain. As a matter of fact, many business concerns could well afford a highly paid Vice-President-in-Charge-of-Thinking About Government.

Do It Right—This work is far too important to be left to the professional lobbyist whose primary claim is that he knows a Congressman or that he calls a Secretary by his first name. The presentation of the business point-of-view requires experience and knowledge; careful and unbiased analysis; recognized integrity and standing; and skill in formulation and placing the position before Government and public.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

There's Some Hope for Drillers

Oil Country Goods May Ease Next Year

At first glance, oil country goods are as tight as ever.

Question is whether buildup among large companies will spill over to independents and jobbers.

■ Oil country tubular goods are going through a balancing-out period. There is hope for more plentiful supply by the end of the year. But right now the overall supply-demand picture shows little change.

Jobber stocks are still virtually non-existent. Independent produc-

ers, who account for half the wells drilled, maintain no inventories. The steel mills carry no oil country inventories. Seamless mills are booked solidly for the second quarter and look for capacity operations the rest of the year. European mills are into first quarter, 1958.

Some Have Supplies—While the situation of the mills, jobbers and independents is largely unchanged, major oil companies have built up fairly comfortable inventories of casing, tubing, and drill pipe. Normal inventories are good for 90 days; current stocks are running three to four months.

As a result, there have been some cutbacks in orders to the mills. These are not widespread. One pipe mill knew of only three major oil companies that had not picked up their full allotments. And released tonnages were quickly snapped up. Purchasing agents testify that no surplus seamless is going begging.

Even among the big producers, the buildup is not universal. At least one major oil company is operating with the bare minimum needed to meet drilling schedules.

It's a Struggle—"We're still fighting for all the oil country pipe and line pipe we can get," said the pur-

... Steel Market Builds Up Offshore

Giant offshore drilling rigs along the Gulf Coast mean a lot to the nation's oil supply.

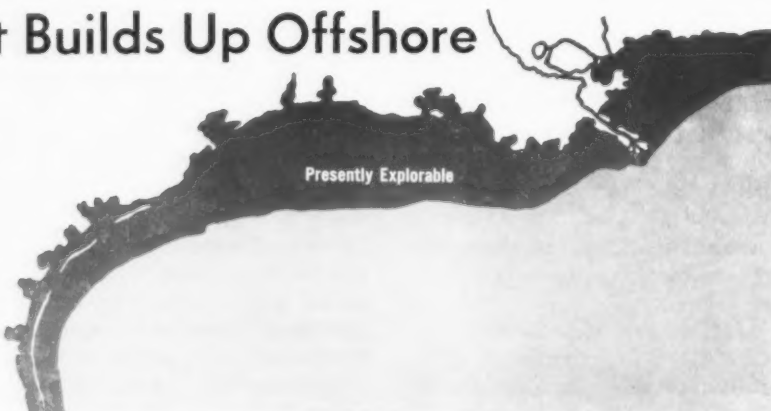
In growing requirements from more and deeper wells, a big steel market develops.

■ Importance of offshore well drilling will grow in the years ahead—both in output of oil and as a market for metalworking.

1957 will be a record year for offshore drilling. Henry J. Wallace, vice president, sales, National Tube Div. of U. S. Steel, predicts 600 wells will be completed with a total footage of 5.5 million ft. Average depth will be 9700 ft, or 2½ times national average.

But by 1970, probably 1300 wells of an average depth of 12,400 ft will be sunk offshore. This will amount to five pct of total domestic drilling, compared with two pct in 1956.

Steel requirements for offshore drilling are estimated in accompanying table.



Future Steel Requirements for Offshore Drilling

Tonnage in Typical Year

Source: U. S. Steel Corp.

	1957-60	1961-65	1966-70
Drilling Platform	63,300	98,200	130,400
Service Vessels	17,900	19,900	22,800
Oil Country Goods			
Tubular	165,000	260,000	370,000
Non-tubular	25,500	40,000	50,000
Line Pipe	75,000	100,000	90,000
Total Tonnage	346,700	518,100	663,200

chasing agent. He said spot ton-nages were being traded off but there has been no real easing of supply. He doubts that his company's inventory of oil country pipe can be brought up to normal before the end of the year.

Both mills and oil companies expect seamless pipe to show some easing in the next six months. Mill production of oil country pipe will top last year's by about 10 pct. Some of this will come from new capacity and from steel released to seamless mills because of slack flat rolled production. This last is negligible since seamless mills have been going all out right along.

Most of the 10 pct production gain will be due to uninterrupted production. Last year's strike cut pipe output 8-9 pct. In a strike-free year, the mills figure to catch up with demand for oil country goods.

Linepipe into 1960's—The linepipe picture continues healthy. For big transmission pipe (24-36 in.), domestic mills are booked through 1960. European mills are into 1961 and 1962. Pipe for gathering and distribution lines (4-20 in.) is also reported strong. There is a certain amount of trading among oil companies to take care of emergency needs but the mills are solidly and firmly booked years ahead.

"It sounds fantastic to talk of solid booking four years ahead," said one purchasing agent, "but when you start adding the pipeline projects, the business is there."

Possible Trouble Spots — Two question marks are tight money and oil imports. All agree that things could change in a hurry if there were cutbacks in drilling or pipeline projects. Of these, drilling is regarded as more stable, since it is not pegged directly on consumer demand but on the need for maintaining reserves.

Regarding growth of foreign oil field activity, domestic mills are not enthusiastic about the market prospect. They will not build new capacity to service an overseas market. For one thing, competition is too wild in times of easy demand.



TAILORED: Kaiser Aluminum fits a 4½-in. slab into a 3-in. jaw.

Two-Way Stretch Does Job for Kaiser

The biggest plate stretcher Kaiser had was too small to handle the giant slab.

But by using ingenuity, engineers were able to make the machine do.

■ Engineers at Kaiser Aluminum & Chemical Corp. had to stretch things to get the job done. Their problem: fitting a 4½-in. thick aluminum slab into the jaws of a plate stretcher with a maximum opening of 3 in.

The problem was brought to Kaiser's Trentwood rolling mill, Spokane, Wash., from Convair Div., General Dynamics Corp. The aircraft maker needed a stress-relieved, stretched section, 19 in. wide and 152 in. long for Convair's B-58, the nation's first supersonic bomber, now on production lines.

Needed Wide Jaws—The Trentwood plate stretcher, which has a pull of up to 10 million psi, could do the job—if its jaws were bigger. Engineers from both companies put their heads together and came up with the answer.

The fit was made by producing fishtail shaped ends on the aluminum plate and tapering them to less than 3 in. thick. Each end was made correspondingly wider than the center, parent-length plate to maintain the same cross-sectional areas.

Once the metal was stretched, the specially shaped ends were scrapped by sawing square behind the necks at the specified length.

Trentwood's 10 million-lb stretcher is claimed by Kaiser to be the largest in service in the country. The company has under construction an even larger one.

How Efficient Are Engineers?

Forum Takes Look at Their Methods

Developing more engineers isn't the only solution to the current shortage.

Equally important is getting the most out of a firm's present work force.

Better work scheduling, proper guidance, more personnel development are good areas in which to begin.

■ Can you put genius on a timetable? Do creative engineers and other technical people need jacking up in administrative matters?

An engineering management conference held recently in Pittsburgh took a hard look at these and related questions. Sponsored by The American Society of Mechanical Engineers and by The American Institute of Electrical Engineers, the session had the general theme of

management controls. Topics included organization, work scheduling and personnel development.

More Minutes to the Hour—Gist of the reports was that modern work ways and modern work tools could get more mileage out of many engineering departments. It was brought out that non-productive time of technical people could run as high as 50 pct. Speaking on work scheduling for routine engineering, Fred Myer of Methods Engineering Council, Pittsburgh, pointed out one reason for low output.

Mr. Myer cited a study in which it was found that a company's engineers spent half the day in conversation. To reduce chatter, daily briefing sessions were started. Talking time dropped to 15 pct. In estimating project duration and setting schedules, says Mr. Myer, you have to know how a job is being done. Standards should be devised.

Sell Scheduling—In the operation of an engineering work schedule, supervisors should remember it's a guide rather than a rigid standard. Progress checks should be made and revisions put through. The schedule will show where additional help or supervision is needed. It will tell when promise dates must be pushed back.

One big point made by Mr. Myer was that work schedules must be sold to engineers. They must be shown the advantages of schedules. The need for this was underlined by floor comments from engineers who had been rubbed the wrong way by schedules and other control measures.

Less Absentee Control—"We get unrealistic completion dates," said one jet engine man. "Our sales department makes commitments and we're told to get it done."

The whole business of maintaining control and providing guidance without destroying initiative is a tricky one. At the Pittsburgh conference, floor speakers complained about absentee supervision, where headquarters engineers relied on written reports as a basis for directives. How can an operating division be autonomous if its engineers are bossed by headquarters, one man wanted to know.

Let Them Ask—This problem was discussed by C. F. Harbach of the Worthington Corp., Harrison, N. J. He said that in a large company, the headquarters group could maintain contact with and control of operating people through things like drafting pools, central research and patent activities. There is no question of formal supervision or reporting here but there is a good line of communication. Mr. Harbach said the ideal situation was for the divisions to come to the central group seeking advice and assistance.

U.S. Puts X-Ray on Engineers

Operation Clinic—Washington is setting up clinics to find out what makes an engineer tick. The aim: determining the most successful techniques for effectively conserving engineering manpower.

A task force of manpower experts will establish the clinics in selected industrial areas to look for tested practices in recruiting of engineers and supporting personnel. Another objective: studying engineering management in job placement, work organization, and additional job training to increase skill.

The group will also take a look at improving engineer morale and incentive by adequate salary scales, opportunity for advancement within

the profession, liaison with top management and professional recognition.

Big Quiz—"The immediate problem over the country," says Dr. Eric A. Walker, Vice-Chairman of the National Committee for the Development of Scientists and Engineers and director of the task force, "is chiefly one of conservation . . . effectively using the engineering manpower we have."

"We are looking for information that can provide a working guide for all industrial areas."

Tentative areas for clinics include Cleveland, Cincinnati, Philadelphia, Los Angeles, Tulsa, Wilmington, Del., and Seattle.

He said that in his own company, centrally imposed standards were kept to a minimum.

Check the Corners—On the question of developing engineers for management work, the need for organized programs was stressed by H. B. Kiphuth of Westinghouse Electric Corp., Bettis Atomic Power Div. He said supervisors at all levels should keep a running inventory of potential manager.

Engineers—Saints Or Sinners?

Engineers are sharply attacked—and vigorously defended at the same time—by George E. Kopetz, Vice President-Production, Blaw-Knox Co.

Discussing what's been wrong with engineers in an address before an alumni group at Carnegie Institute he lists the following defects:

They lack professional spirit and pride.

They allow themselves to get sidetracked into fields where there's waste and little challenge.

They get grooved into routine, inadequate assignments.

They don't emphasize the creative functions of engineering.

They still lack enough of the profit-minded spirit.

Front Office Faults — However, Mr. Kopetz doesn't put all the blame on the engineer. He calls management to task for these faults:

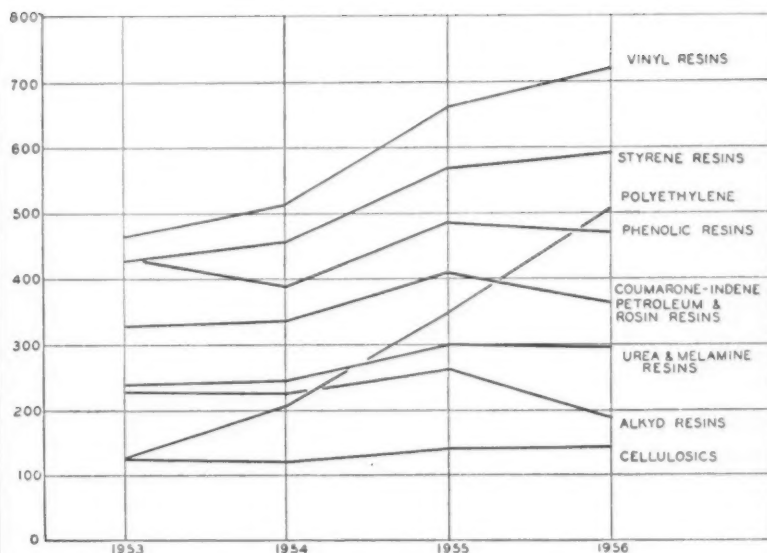
Mass hiring of engineers without regard to their individual future careers.

Pigeon-holing them in routine drawing assignments for long periods.

Diverting them to administrative work that is really glamorized clerking.

Adding more and more bread to the engineering work sandwich by increasing repetitive and paper work.

Continuing them in too much spot detail and custom engineering where it's no longer a creative function.



ERRATIC SALES PATTERN FOR PLASTICS: Sudden increases in demand for many plastics and resins create a special problem for producers and fabricators.

Plastic Makers Look At Problems

Unsound economics is seen as the most common shortcoming among fabricators.

An executive maps out a plan for unifying industry standards and improving capitalization.

■ Weakest link in the growing plastic industry is the fabricator. Many a fabricator's problems stem from poor relations with the suppliers of plastics fabricating machinery.

These charges were made by John O'Connell, president of Consolidated Molded Products Corp., at a meeting of the Commercial Chemical Development Assn. in New York.

Economics Unsound — Of the 6000 or more firms engaged in molding and extruding plastics, Mr. O'Connell said, rigid converting and film and sheet converting firms com-

prise the largest number. "They enjoy the dubious distinction of having the poorest organization, the least sound economic base, and the most perplexing problems," he stated. Among their problems are:

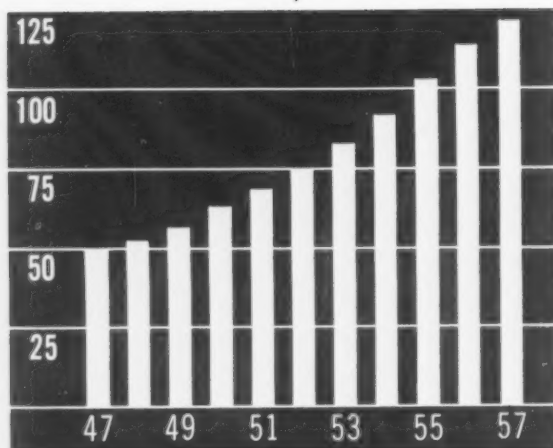
(1) Too low profits (2½ to 4 pct) in a period of high activity.

(2) A disproportionately high percentage of net worth invested in plant.

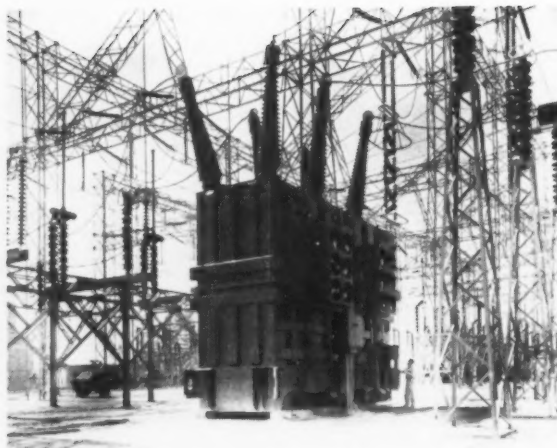
(3) High liabilities in relation to net worth.

(4) Ratio of assets to liabilities under the accepted level of 2 to 1.

Cooperation Needed — Aside from the need for more capital, the major headache for fabricators is the need for new and better machinery, Mr. O'Connell believes. He says that most plastics equipment should be replaced in 10 to 15 years. And injection molding equipment should be replaced in less than 10 years.



TOTAL CAPACITY: In millions of kw. Source: Edison Electric Institute.



AUTOTRANSFORMER: Giant units like this from Westinghouse are in demand.

Suppliers Thrive on Power Surge

Spending This Year: \$3.8 Billion

Big expansion plans of electric utilities mean equally big business to makers of heavy generating equipment.

Here are some forecasts of industry leaders on long range plans to increase capacity.

There are problems, but they are not problems of demand.

■ The high voltage push of the electrical equipment industry hasn't slowed, despite the static noises from a number of industry customers forecasting their expected business levels.

Heavy electrical equipment installations boosted power generating capacity in the U. S. by 4.5 million kw in 1956. In 1957 the industry will install 6.7 million kw of generating capacity at a cost of \$3.8 billion, according to Edison Electric Institute president Donald Kennedy.

Good Reports — General Electric's president, Ralph Cordiner, states GE's business has doubled in

the past eight years, and will double again the eight years ahead. Westinghouse president Gwilyn Price reports that unfilled orders at the beginning of this year were 86 pct ahead of the order backlog at the end of 1954. The 1954 period was used because of a strike that cutback Westinghouse production in 1955.

Mr. Price summed it up, "We foresee in 1957 the highest output and billings in the company's history, and an improvement in profits."

Suppliers Are Happy—For suppliers to the heavy electrical equipment industry, as well as suppliers of all the auxiliary equipment used in these installations, it suggests an excellent business year—perhaps an all time high. The proof of the pudding is in the appropriation of money for new construction.

Westinghouse has at least \$1,900,000 committed for long term improvements in a single division. It's almost a necessary investment, since the expenditure will produce ultimate savings in manufacturing costs of \$1 million a year.

Utilities Plan Big—Consolidated Edison in New York, one of the biggest of U. S. utilities, announced earlier a cut of \$11 million in 1957 expansion expenditures, then tempered the cutback with announcement that at least \$650 million will be spent in the 1957-1961 period. Commonwealth Edison at Chicago announced a plan of exactly equal size, but an increase from \$137.3 million in 1956 to \$190 million in 1957; and another \$170 million in 1958. More evidence of the health of the heavy electrical equipment market: GE has spent \$1.4 billion on expansion since the close of World War II, but plans to spend a half-billion in the 1956-1958 period. Allis Chalmers is bringing in a new transformer plant at Terre Haute, Indiana, at mid-year, and is expected to announce further expansions before the beginning of next year. Philip Sporn, president of American Gas and Electric, told IRON AGE that he believes his firm will spend \$170 million for expansion in 1957 as opposed to \$150 million in 1956.

The Question: Are producers of electrical equipment producing themselves right out of markets? The statistics suggest that, quite the contrary, they'll be hard put to keep up with the galloping gain in electrical current consumption. Over the 1946-1956 period expansion of electrical capacity has gone up at a 9.5 pct annual rate. At the same time, consumer appetite for electric power has pushed current consumption up 10.5 pct per year.

The result is already evident. Order backlogs for heavy electrical equipment are still gaining, or at least have done so through January and February. Deliveries have improved somewhat, as copper and steel have moved into freer supply, but even the rising shipping rate of finished goods from producers' plants has failed to dent the order backlog.

Atomic Power Coming — The question is not whether capacity is for too much electrical power output, but can enough be produced? The industry already uses 105,000,000 tons of coal each year for steam generated electrical current. One forecaster warns power engineers that by 1965, at the present rate increase in or demand for electrical power, the question of how long coal reserves in the U. S. can last is arbitrary. We will be running out of manpower to mine sufficient quantities of coal to handle the electrical industry requirements by that time. Hydroelectric can't help. Atom-powered electricity just has to be evolved and the sooner, the better.

Historically, heavy electrical equipment producers and the power companies buying their products have figured that the industry doubles in size every ten years. The figure is obsolete. It is now doubling every seven to eight years and the rate of growth seems to be still accelerating.

Short term or long term, heavy electrical equipment and its host of suppliers are in for a crackling good year, and a pretty good decade after that.

Ganging Up on The Tech Shortage

Gripping about lack of technical personnel is one thing. Doing something about it is another matter.

Here's how cooperative action was taken by the firms in one area.

■ What can the firms in an industrial community do when they find themselves competing for the same, small labor pool?

Can they work together to eliminate the conditions that make piracy of each other employees so attractive—and so costly?

Actually they can do a lot. Industrial companies in the Delaware Valley area have shown the way with their Design and Drafting Council. The Council was born last year as a voluntary self-help organization for the local solution of a nationwide problem. That problem is the shortage of "second echelon" technical personnel—the draftsmen, designers and technicians who could handle the "support jobs" currently filled by engineers.

Talk It Out—Delaware Valley firms, admitting to each other their problems in locating, hiring and keeping design and drafting personnel, decided to try group action. Getting together with educational, governmental and civic groups they setup the Council's steering committee. The committee recommended, as the first step, a public airing of the problem. This resulted in the First Design and Drafting Workshop held late in 1956 with an attendance of more than 300 delegates.

At panel group meetings the delegates tore into such problems as improving employment recruiting

methods, establishing uniform position titles and job classifications, strengthening training techniques and fostering interest in drafting at the high school level.

Then Suggest — Recommendations followed the panel discussions and the Council's Steering Committee appointed sub-committees to take action on the recommendations. Here are some of the suggested courses of action, many now being put into practice:

In education: Review the current drafting curriculum in the area's schools. Study and recommend methods for encouraging young people to enter the drafting profession.

In training: Industry-wide approach to the organization and supervision of apprentice programs.

More effective school guidance programs through encouraging industrial visits by students and faculty.

Set up a speakers bureau to inform the public about current conditions in the design and drafting fields.

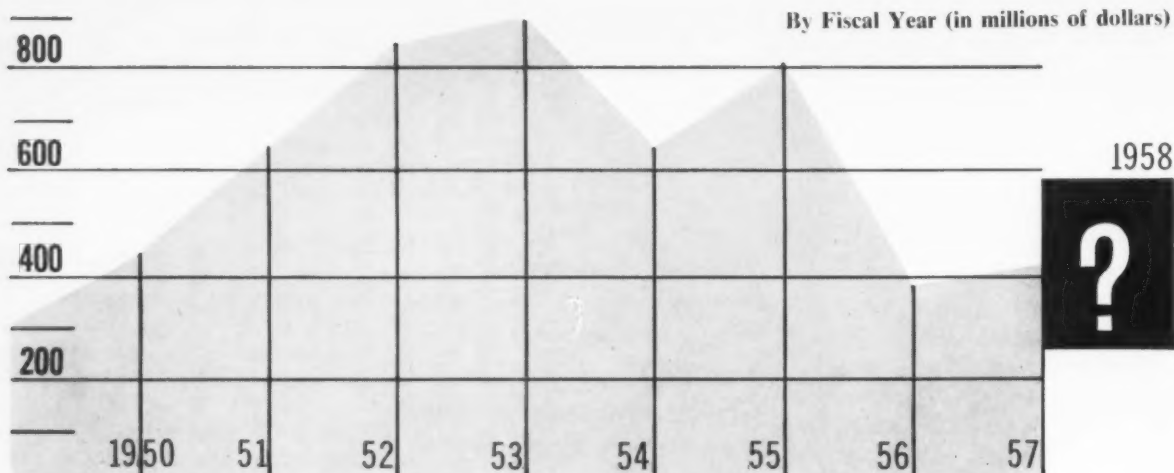
In industrial recruiting: Establish a code of ethics among industries in the Delaware Valley Area.

Encourage over-age personnel to re-enter the drafting room or use their experience to teach drafting.

Enlist the aid of existing employees in recommending candidates for employment.

In establishing job definitions: Request that all companies adopt a job evaluation or classification system covering formal position descriptions.

Unify language and job titles and their relationship to pay scales so inflationary spirals and competitive up-bidding can be recognized.



WHAT'S AHEAD FOR STOCKPILE SPENDING? Congress will cut back ODM fiscal 1958 appropriation.

Stockpile Spending Fades Away

Congress slashing ODM appropriation request. Will reduce stockpiling, bartering.

Zinc and lead will play second fiddle in fiscal 1958.

▪ Don't count on either purchases for the national stockpile, or the barter program to lend much support to zinc, lead, and other metal markets for much longer.

Congress is forcing the Office of Defense Mobilization to slash stockpile purchases even more than had been originally intended. This will seriously reduce Commodity Stabilization Service swapping for the national stockpile. And CSS is not sure exactly where it stands on material for the supplemental stockpile.

Here's The Picture — ODM is spending about \$425 million on the national stockpile in fiscal 1957 (July 1956 to June 1957). It had figured on spending \$80 million less, or about \$345 million in 1958. It asked Congress for an appropriation of \$130 million. The House of Representatives knocked out the entire request.

As of now ODM may contract

on the basis of \$146 million it will carry over from 1957, an expected \$6 million from contract cancellations, and an estimated \$77 million on sale of certain items, stocks of which are rotated because of their perishable nature. No obligation may be incurred by ODM unless it has the money on hand to make payment, even though the actual expenditure may not be made for a year or so.

Outlook is that the Senate will OK some money for the stockpile, but obligations will be incurred at less than half the current pace. This will put the emphasis on buying for minimum objectives, says ODM. Both lead and zinc are on the so-called long-term list, which means they will play second fiddle.

Higher Maintenance — Another factor which will reduce the amount to be spent for new material is the high cost of maintaining what has already been purchased. More than half the sites where materials are stored are leased from industry at high annual cost. As the stockpile grows, so does the custodial expense.

Commodity Stabilization Service gets the word from ODM on what

to barter for, and how much. On that basis it reviews bids from American firms for items on a published list of agricultural commodities in exchange for strategic materials. Agreements made are on the basis of market prices.

The agricultural products (from the Dept. of Agriculture price support program, through Commodity Credit Corp.) must be exported. Strategic materials must be imported (from friendly countries, at least 50 pct on American ships).

Where—Materials acquired are assigned to one of three places; (1) minimum national stockpile, (2) long-term national stockpile, and (3) supplemental stockpile. Before this, it is carried on the inventory of Commodity Credit Corp. ODM signifies probable disposition when it requires acquisition, but reserves the right to change its mind.

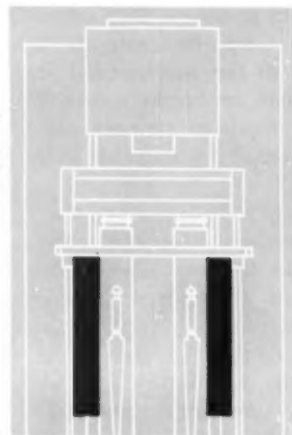
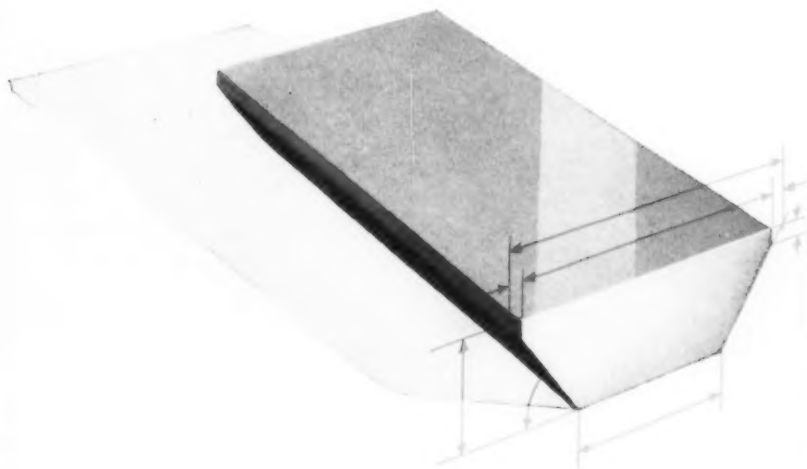
Commodity Credit Corp. must be paid for the products it supplies for the exchange. The main goal of the barter program is to dispose of surplus farm products profitably before they spoil. Material for both the minimum and long-term stockpiles, are paid for by ODM.

If ODM spending is slashed to

J&L hot extruded cold drawn cam rail section

cuts machining cost

from \$1.75 to 75¢ per foot



"This part was previously milled from a cold rolled section at a cost of approximately \$1.75 per running foot. Our present cost is 75¢ per foot using your cold drawn extruded section."

This machine tool manufacturer cut his production costs by buying these exclusive J&L steel sections. You can obtain similar savings:

1. Eliminate machining and finishing operations.
2. Reduce scrap losses almost to zero.
3. Eliminate cost of casting and forging intricate sections.
4. Reduce inventories because extrusions are quickly available.

Investigate this new production technique for your shape profiles—within present limits of a design which can be inscribed in a three-inch circle. You'll surely boost production, cut overall cost. For complete details write to the Jones & Laughlin Steel Corporation, Dept. 403, 3 Gateway Center, Pittsburgh 30, Pa.



Jones & Laughlin
... a great name in steel

the bone the agency will have to cut barter ordering accordingly, or force CCC to carry the material on its own inventory. This is now merely a transitory step in the transaction.

ODM may also tell CCC to send the material to the supplemental stockpile. In this case it doesn't have to pay for it. But it has no control over the material and may not apply it to national stockpile objectives.

Authorized, But — No one in Commodity Stabilization Service is sure of exactly how CCC will get its money. Section 206, Public Law 540, 84th Congress states, "In order to reimburse the Commodity Credit Corp. for materials transferred to the supplemental stockpile there are hereby authorized to be appropriated amounts equal to the value of any materials so transferred."

But CCC has not asked Congress for reimbursement under this law yet. So the actual mechanism is untested. Commodity Stabilization Service officials, who handle the actual barter transaction, point out that the appropriation is by no means automatic. They feel that eventually a request will be made and hope Congress will come through. But they are not sure what the next step would be if an economy-minded legislature refuses remuneration.

Set Minimum Steel, Iron Truck Rates

The Interstate Commerce Commission has prescribed minimum rates on iron and steel items to be transported by motor carrier in the Northeast. It will probably mean some increases, but no reductions are expected.

Confused Situation — The ICC termed the condition of the motor carrier rates "chaotic," said the minimum was established to "prevent destructive competition."

Motor carriers are now required to publish specific rates.

States affected are Connecticut, Delaware, Kentucky, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, District of Columbia, and parts of Wisconsin, Iowa and Missouri.

Military Research

Next year Congress will be asked to sweeten the pot of military research and development funds.

The military are asking \$1.65 billion for direct research for the year beginning July 1. They plan to spend \$1.58 billion.

Actually, they'll spend nearly four times that. Pentagon budget experts say some funds allocated for other programs may pay for research and development.

Close to \$6 billion may be earmarked for scientific tests and research tasks in the fiscal year ahead. About \$5.2 billion is being spent in the current year.

\$2 Million For Foil

Kaiser Aluminum & Chemical Corp. will spend over \$2 million for a new foil processing plant at Belpre, O. This will include such equipment as three-wide, high-speed laminators and a wide, high-speed multicolor rotogravure press.

Foil for processing will come from a new Kaiser rolling mill at Ravenswood, W. Va.

Preliminary engineering is about finished. Construction will begin this spring.

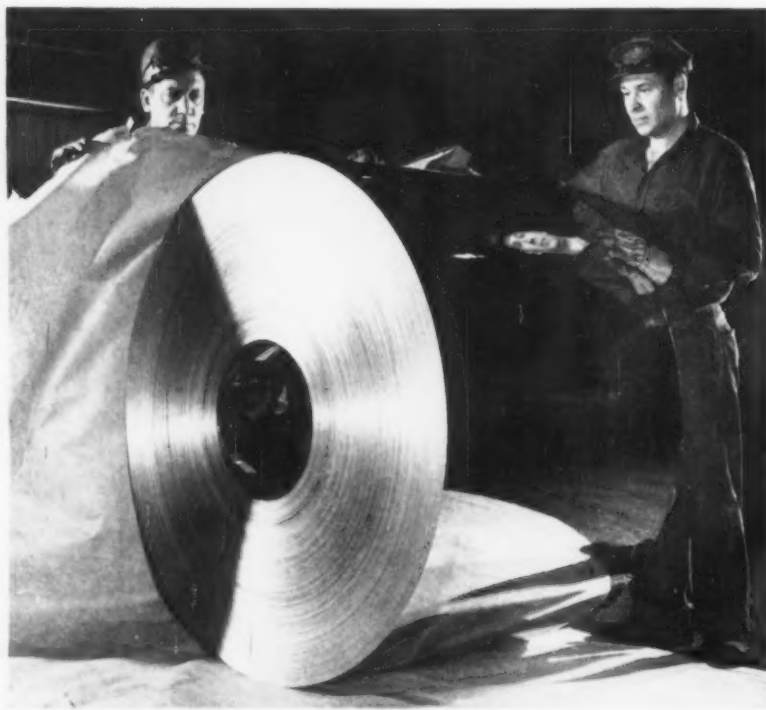
New Bearing Plant

Link-Belt Co. will build a new bearing plant in Indianapolis, Ind., to replace, and up by 50 pct, the capacity of its present plant.

Project will cost about \$5 million.

Construction will begin this year, to be completed in 1958, with production of anti-friction bearings scheduled to begin in 1959.

Except for a two story office, the structure will be one story.

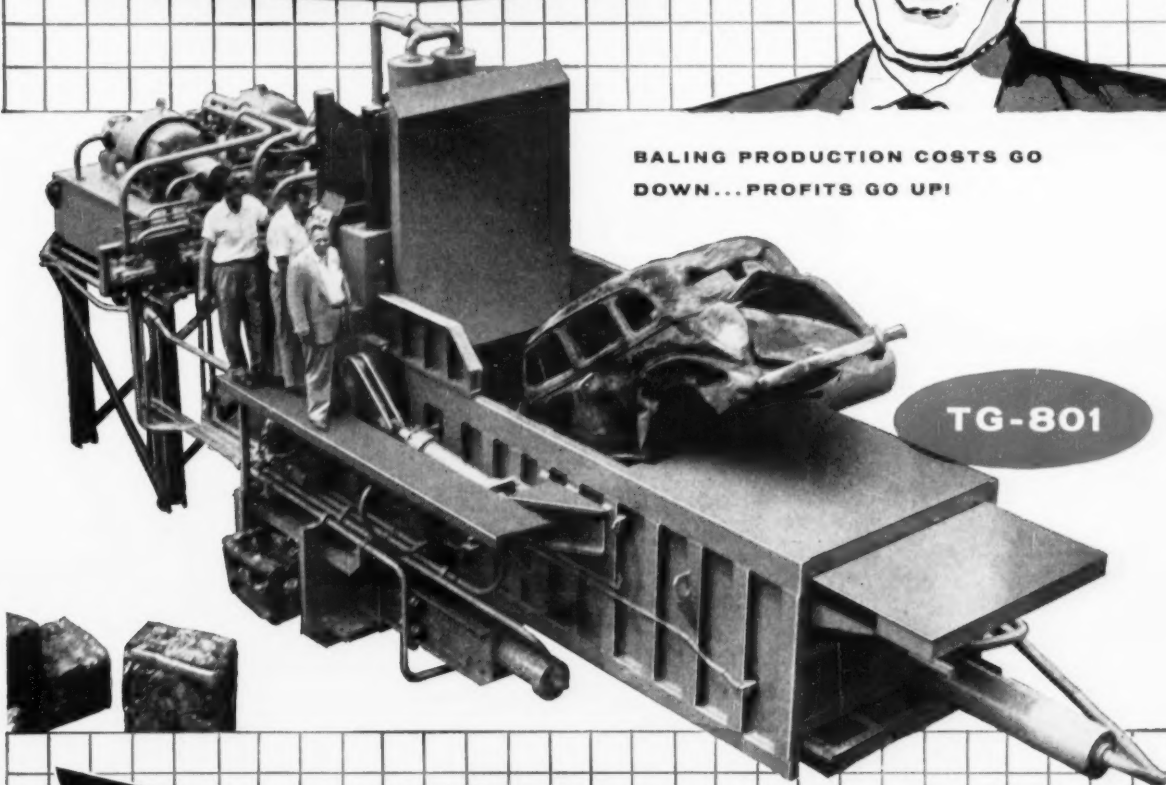


IT'S THE BIGGEST: Jones & Laughlin Steel Corp. workmen are reflected in 15,000-lb tinplate coil to be shipped from the Aliquippa Works to American Can Co. J & L says it is the first coil of that size to be shipped for can making. Shipments are usually in cut sheets.

scrap metal men
with engineering know how
are using Harris Presses



BALING PRODUCTION COSTS GO
DOWN...PROFITS GO UP!



TG-801 is the workhorse of the industry. The charging box is 76" wide x 62" deep x 120" long. This handles whole bodies with frame. Bales come out without lip or chair-back at the rate of 15 tons per hour. If you are handling, or plan to handle this type of scrap **TALK WITH A MAN FROM HARRIS.**

SEE HARRIS PRESSES ON LOCATION!

WORK EFFICIENTLY FOR GREATER PROFIT

**HARRIS FOUNDRY
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Reclamation Engineers Since 1889

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VICTOR TORCH with cutting tip of Anaconda Tellurium Copper, which has the resistance to heat and wear required to maintain uniform flame characteristics through a long life of service.

Tellurium Copper makes better cutting and welding tips



Two typical Victor torch tips of Anaconda Tellurium Copper-127 shown full size.

THE PROBLEM: Victor Equipment Company of San Francisco first used regular leaded copper rod in making tips for its line of cutting and welding torches. In some applications, however, the leaded copper did not stand up under high heat conditions.

THE SOLUTION: Victor tried Anaconda Tellurium Copper-127 Rod and found the answer. The Tellurium Copper had a much higher heat resistance. This meant long, trouble-free service for its precision-made cutting and welding torches in all types of applications. At the same time, the Tellurium Copper provided uniform machinability, especially important in drilling the deep holes prior to completion by swaging on mandrels.

FREE TECHNICAL SERVICE: No matter what your special problem may be, The American Brass Company can very likely furnish free-cutting copper and copper-alloy rod to meet the requirements of the product or the operation.

It is the function of the Technical Department of The American Brass Company to assist metal users in the selection of Anaconda Rod. This service is at your disposal without charge or obligation. Comprehensive data on composition and machinability of standard Anaconda Rod Alloys, together with specification references, weights and dimensions, are available in Publication B-3. For this booklet—or technical assistance—write: The American Brass Company, Waterbury 20, Conn. 5765

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COPPER ALLOYS

MADE BY THE AMERICAN BRASS COMPANY

Johns H. Congdon, II

A Flexible Management Survives

Keeping one step ahead of customers' needs is all-important to this warehouseman.

He went way out on a limb, gambling traditional business on what he saw to be a sure thing.

Because his company was able to bend with a changing steel market, it flourishes today.

■ For a steel warehouse to discontinue an industrial supply business that took 150 years to build takes more than a little courage on the part of management. You can bet somebody's hide hangs in the balance.

Such was a decision Johns H. Congdon, II had to make about a year ago. He still has his skin, and business is fine. His reward was the presidency of venerable Congdon & Carpenter, Providence, R. I., the nation's second oldest steel warehouse.

Ambitious Goal—As Mr. Congdon will tell you, a company can't stand still, no matter how successful its past record. He tackled the reorganization with his eyes wide open. His goal was to replace industrial supply business with steel, stainless, and aluminum sales, even though the change meant a probable reduction in annual sales volume.

To keep on top of the market, Mr. Congdon held intensive Monday morning meetings with the sales, operations, merchandising, and advertising managers. He plugged away for faster deliveries. He realigned sales and delivery territories between the firm's Fall River and Providence warehouses. And he initiated surveys to learn



Johns H. Congdon, II: A company can't stand still.

customer requirements. Then he stocked in the items they needed.

Teamwork Does It—The result has been an almost complete recoup of the sacrificed industrial supply business. And the company is looking forward to an even bigger share of the market.

Like a star quarterback on a Yale (his alma mater) football squad, Mr. Congdon modestly credits the company's success to his "management team." The team helps keep all phases of the business in touch with latest developments.

Promotes His Industry—A company's prosperity goes beyond its

front office, contends the 41-year-old ex-artillery captain. He puts in a lot of time promoting local growth as chairman of the industrial division, Greater Providence Chamber of Commerce, and as vice president, Business Development Co. of Rhode Island. He's director of the American Steel Warehouse Assn.

Congdon & Carpenter has weathered a lot of changes since it was formed in 1790 by Joseph Congdon. The firm's management has passed on through six generations of Congdons. And apparently, each has had the foresight needed to keep a long-established business from sinking into the quicksand of old-fashioned business tradition.

HOW TO RUSTPROOF BLACK PLATE



Rust is a problem anytime, but it's particularly serious with black plate. On this light gauge, dry, uncoated steel, rust can start from a fingerprint. "Sweating" due to sharp temperature changes will cause immediate rusting on surfaces and edges.

Leading mills are now eliminating rust problems by packaging black plate in Ferro-Pak, Cromwell's volatile corrosion inhibitor paper. Chemical vapors from Ferro-Pak form an invisible film around the steel that prevents rust from getting a start, even when moisture is present.

The new Ferro-Pak sheet above was custom-made by

Cromwell's "Paper Engineers" to meet steel mill requirements for shipping black plate and dry sheet steel. It is water-proof, strong, yet highly flexible and easy to handle. Its chemical rust inhibitor is non-toxic . . . compatible with oil . . . stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write **Cromwell Paper Company**, 4803 South Whipple St., Chicago 32, Illinois.

FERRO-PAK[®] by Cromwell

"Paper Engineers"



RUSTPROOFING A FREIGHT CAR. Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

Economy Shifts to Meet Change

General business continues at its record level. It should hold through most of this year.

Part of the continued high level depends on ability to meet changing conditions.

■ You can stand or fall on business conditions as they are today. With a few seasonal and other exceptions, the business level of March should stand up through most of 1957. After that, it depends on how the public reacts to this so-called plateau.

If the high (if somewhat spotty) rate of business and industrial activity continues to generate optimism, you can look for an equally good year in 1958. If it results in a feeling of uneasiness, there might be a moderate decline.

Economy Is Adapting — There are indications that the economy has developed a strong resilience and an ability to react to changing conditions. This is in contrast to resistance to change that has characterized other periods.

For example, even though manufacturing employment was off slightly in February and into March, total employment reached a new high. The difference was more than made up in increases in employment in construction and trade.

Income at Record Level—This has resulted in a record rate of personal income and a sustained high rate of consumer spending. Dept. of Commerce figures show that retail spending is about 7 pct higher than a year ago.

It should be noted that workers are getting less overtime, but generally higher wage rates. Again, total employment is greater.

Many businessmen, taking a long look at continued high consumer income, have decided to go ahead with planned expansion and modernization.

Confidence Returning—There is no doubt but that a lot of uneasiness was reflected in executive attitudes in recent weeks. If anything had a stimulating effect on

business plans, it was the continued high rate of buying on the part of the wage earners, who are satisfied with their take-home pay, and confident that it will continue.

With the conviction established that a sustained and prolonged demand for goods and services will continue, decisions to bet on a growing economy for the most part have been apparently reaffirmed.

... Behind Utilities' Plans

Plan Ahead—Don't let the significance of expansion plans of public utilities escape you. Utilities have to plan their expansion programs ahead of the rest of private industry, to be ready with needed power.

This year public utilities as a group expect to lay out more than \$6 billion for new plants and equipment. This is nearly a full 25 pct increase over 1956. Dept. of Commerce indicates over 30 million kw of capacity will be added in the 1957-59 period, a one-third boost.

To Meet Demand—What this means is that electric companies are predicting that much of an increase in consumption of electric power within that time or shortly after.

In general, electric companies have concentrated recently in extending and increasing transmission facilities. This new program of expansion of generating facilities is the first major surge since facilities started during the Korean conflict were completed. Extending transmission lines has been the trend.

Will High Inventories Hurt?

A Critical Factor — Inventory policies continue to be a question mark. There is always a possibility of severe inventory control policies sending the economy into a decline.

Inventories are not dangerously high when related against the high rate of manufacturing. Then too, there is a growing tendency in a period of rising prices to consider stocks of materials as money in the bank—unless the cost of storing them and the factor of tied-up capital become excessive.

Compare with 1953 — As it

stands now, total durable goods inventories stand at about \$29 billion. There is evidence of a leveling off or slight decline in recent weeks. This compares with the peak of about \$26 billion in 1953.

Breaking down durable goods industries' inventories, purchased materials account for \$8.2 billion, goods in progress \$12.4 billion, and finished goods \$9.3 billion.

A similar comparison for the 1953 peak shows purchased goods at \$7.9 billion, goods in progress \$10.7 billion, finished goods \$7.7 billion. 1954's decline followed.

What Kind of Auto Trim Do You Like?

The Committee of Stainless Steel Producers, American Iron and Steel Institute, has released the results of its survey on automobile trim.

Car owners throughout the nation were asked what kind of trim they looked for when buying a car, and why.

The survey was made by an independent research group. Interviewers were instructed to keep the sponsor's identity secret, and to avoid prejudicing those interviewed for or against any particular trim material. Here are the results.

Should auto manufacturers put more, less, or about the same amount of trim on new cars?

More ——— 4.7 pct
Less ——— 35.7 pct
Same ——— 59.2 pct
No opinion — 0.4 pct

Do you feel this way because of unpleasant experiences? (Asked only of those answering "less trim.")

Yes or Partly — 47.0 pct
No ——— 49.7 pct
No Answer — 3.3 pct

What material, in your opinion, is best for auto trim?

Stainless Steel — 57.0 pct
Metal B* — 21.4 pct
Metal C* — 11.1 pct
No Opinion — 12.5 pct

Would you pay a premium price to have all trim made of the material you named as best?

Yes ——— 40.1 pct
No ——— 59.0 pct
No Answer — 0.9 pct

Did the salesman mention that any trim parts were made of specific materials?

No ——— 60.3 pct
Yes ——— 12.9 pct
Don't Recall — 26.8 pct

*Materials not disclosed, although metals were designated in survey. Total more than 100 pct due to multiple answers.

American Motors Fate Is Set

When Louis Wolfson took over as AMC's No. 1 stockholder, he hinted at making changes.

Rumors were strong that the company might drop its senior car lines.

Now it looks like George Romney, AMC's president, has won Wolfson over.—By T. L. Carry.

■ The fate of Nash and Hudson autos apparently has been decided. American Motors Corp. President George Romney says that he and Louis Wolfson, AMC's largest stockholder and most important critic, are in complete agreement. Both see eye to eye on what should be done to pull the company out of the red. Romney emphasizes that he and the Florida financier are interested in the growth and expansion of AMC.

What is causing tongues to wag in Detroit is the evident about face of Mr. Wolfson following a 2-day meeting in Miami with Mr. Romney. Prior to the meeting Mr. Wolfson had said that he thought there were areas in the company where "pruning, trimming and paring" would serve to its advantage. There was a strong belief in automotive circles that AMC's senior cars, Nash and Hudson, would be dropped from the company.

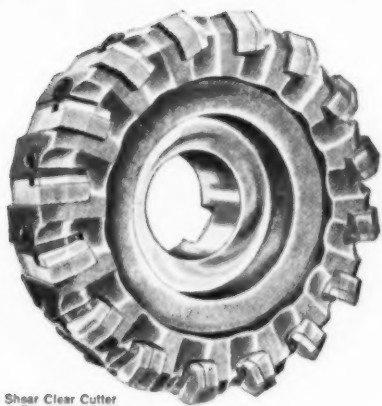
Tooling Up—This is not the case. Mr. Romney says the company's objectives are to continue its automotive, appliance and defense business. In addition, the firm now plans to add to these programs with a new plan of expansion.

The company plans to bring out 1958 models of both the Nash and Hudson. Tooling for these cars is already largely completed. In addition,

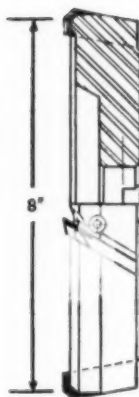
Mr. Romney says that preliminary work on the 1959 and 1960 models has already started. So if there is any pruning to be done, it won't be in the company's big car lines. At least not at this time.

Balancing Inventories—In regard to the big cars, Mr. Romney points out that, although sales are off about one-third so far this year, the company's position in this respect is still better than it has been. As proof, he cites the fact that the company has made only 1200 more cars than dealers have sold so far this year. Stocks are 18,000 units lower than they were a year ago. Although wholesale billings are lower, operating results are much better.

Mr. Romney also predicts that the company will be in the black by the early part of 1958. He cites the long lead time needed to bring



Ingersoll Shear Clear Cutter
27000 series... Pat. No. 2108417
Page 14, Catalog 66



Feed rate increased $2\frac{1}{2}$ to 5 times at Vaughn with this **INGERSOLL SHEAR CLEAR® CUTTER**

The cutter previously used was nullifying the investment in a new standard, knee-type milling machine. The machine had more power than was being utilized. The feed rate was only 12" per minute. The change to Ingersoll Shear Clear permitted the Vaughn Machine Company, Cuyahoga Falls, Ohio, to capitalize on its machine investment and obtain the economy and efficiency of increased feed rate. A feed range of 30" to 60" per minute, when milling rough forgings and steel castings, is now continuously maintained.

Ingersoll inserted blade cutters are used on all makes of machines for milling and boring a wide range of materials. An Ingersoll Cutter Division representative will be glad to discuss this and other feed rate experiences with you.

Whether you are concerned with feed rates, longer tool life, finish or cutter costs, the new Ingersoll cutter catalog will be a valuable guide. Write Department 66N.



Use this new 82 page guide for selecting the right inserted blade milling and boring cutters for your work. Write for catalog #66, today.

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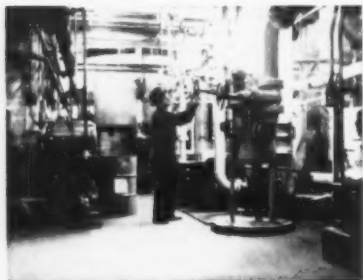
ILLINOIS

PITTSBURGH STEEL'S
BLOOMING-SLABBING MILL
Monessen Works, Monessen, Pa.

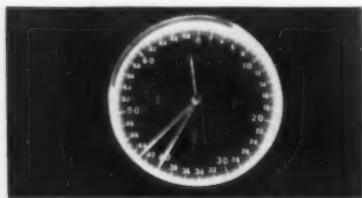


Time exposure shows continuous motion of red-hot ingot as it travels through roller.

"Never replaced screwdown or nut using Cities Service E. P. Lubricants!"



Circulating System located on floor below mill, uses Cities Service E. P. Oils. Mill operates 160 hours a week, has never had lubrication failure.



Dial Gauges Accuracy to 1/32 of an inch. It is used by operators in the pulpit, who control the mill's 7000 horsepower and shape its steel to unusually fine tolerances for a blooming operation.

Ever since the installation of this blooming-slabbing mill at Pittsburgh Steel Company's Monessen Works, Cities Service E. P. Oils have been used for lubrication.

During that time, over 4,000,000 tons of steel have been run through the mill's huge rolls . . . but never once has the firm found it necessary to replace the screwdown, nut or any bearing due to lubrication failure.

A Pittsburgh Lubrication Engineer says: "Oils stay with the parts that must be lubricated and never give us a problem."

Where an inferior lubricant might be wiped away during the regular operation of the mill, Cities Service E. P. Oil withstands continuous operation. In addition, the oil can be centrifuged and yet not lose its additive.

Pittsburgh Steel is one of an increasing number of steel manufacturers who report outstanding results with Cities Service Lubricants. A Cities Service Lubrication Engineer will be happy to supply all the reasons. Or, if you prefer, write Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Automotive Production

WEEK ENDING	CARS	TRUCKS
Mar. 30, 1957	131,090	23,000
Mar. 23, 1957	138,646	23,220
Mar. 31, 1956	125,781	24,082
Mar. 24, 1956	131,287	23,690
TO DATE 1957	1,792,200	276,600
TO DATE 1956	1,742,934	313,105

*Estimated. Source: Ward's Reports

out cars and adds that the 1958 program will be the first one completely planned, engineered and tooled since the formation of the company in 1954. It is hoped that the new products will gain wider acceptance.

Defense Work Lags—As for the defense aspects of AMC's business, Mr. Romney is disappointed in the amount of work his company has been getting. "We get many encouraging words but few results," is the way he puts it. However, it's possible that sometime this year, the government will extend a contract to the company for the V-4 engine which was recently developed.

Mr. Wolfson figures rather largely on the diversification front. Although it is not known just what companies are being considered for acquisition, it is a fact that at least "one or two" of them are controlled by Mr. Wolfson.

Tempting Tax Loss — Evidently many companies are being considered but only those with the greatest growth potential will ultimately be acquired. This has led to speculation that AMC may soon branch out into the electronics field.

The advantages of expanding are almost self evident. Mr. Romney points out that AMC currently has a tax loss credit of \$36 million. Such a proposition should not be taken lightly and evidently Mr. Wolfson and Mr. Romney do not intend to do so.

In fact, Mr. Romney says the AMC may be started on its new expansion program before the end of the year. Although the company still has a tough road ahead of it, the outlook isn't as grim.

Mr. Wolfson's reputation may have helped it along. In addition, if the current plans are carried through, it is entirely possible that AMC will be making money by next year or even sooner. On the surface it appears that nobody is playing games with AMC's future and the company will stay in business.

Chrysler-UAW Hassle Simmers Down

The latest hassle between the UAW and Chrysler Corp. has cooled off somewhat but there are still a lot of glowing embers in the ashes.

It all started from a speech in New York where F. W. Misch, Chrysler's financial vice - president, pointed to the company's success so far this year and gave as one of the reasons the introduction of new work standards for the 1957 model run.

At the same time, Mr. Misch gave the impression that the UAW cooperated with the company in introducing the new standards. Then it leaked out that Chrysler

had eliminated 20,000 jobs and the dam broke.

Reuther Acts Fast — Walter Reuther, UAW president, roundly condemned the company for daring to suggest that the UAW had agreed to the program. Actually, Mr. Reuther had no other choice because of the fast approaching UAW convention in Atlantic City, N. J. He couldn't possibly go into the convention and have the delegates think that he agreed to eliminate some 20,000 jobs.

The only solution was to hit back and do it quickly. So far, it appears that the counterattack was successful.

Change Is Overdue—It is generally agreed in Detroit that the new work standards were long overdue at Chrysler. The methods put Chrysler on a more competitive basis with the other members of the Big Three.

If it didn't do something about its high costs of production, it would only be a matter of time until it, too, joined the ranks of former auto producers. Union realizes this.

THE BULL OF THE WOODS

By J. R. Williams



200 SERIES STAINLESS STEEL PRODUCTION IS REALLY ROLLING— with ELECTROMET Alloys

Demand is growing for the Cr-Ni-Mn 200-series stainless steels. They are popular and economical for such products as kitchen utensils, appliances, truck bodies, and automobile trim. ELECTROMET helps steel producers meet this growing demand with a *variety* of alloys designed to suit specific melting requirements.

FOR EXAMPLE...

The popular alloys for the addition of nitrogen in 200-series production are ELECTROMET nitrogen-bearing electrolytic manganese, SIMPLEX nitrogen-bearing ferrochrome and nitrogen-bearing low-carbon ferrochrome.


For the addition of manganese—ELECTROMET electrolytic manganese metal, low-carbon ferro-manganese, and MAN-SILO alloy are the favorites.

And, of course, ELECTROMET offers the largest selection of chromium alloys, including—"EM" ferrochrome-silicon; low- and medium-carbon ferrochrome; SIMPLEX low-carbon ferrochrome; low-chromium and regular grades of high-carbon ferrochrome; and charge chrome.

The 200-series stainless steels are the result of basic work carried out at the ELECTROMET Research Laboratories. Stainless steel producers have been granted royalty-free licenses under the patents covering these developments.

For full information contact the nearest ELECTROMET office.

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"Electromet," "EM," "Mansilo," and "Simplex" are registered trade-marks of Union Carbide.



Cr-Ni-Mn 200-series stainless steels are becoming increasingly popular for both household and industrial products fabricated from stainless strip. Here the final pass on finishing rolls gives surface finish and hardness to the strip.

What Follows Teamster Probe?

Laws to Prevent Abuses Inevitable

Dave Beck is only the beginning in Senate study of union finances.

It will take all year to do the preliminary work. Legislation will have to wait until next year.

Irate rank-and-file also demands action.—By G. H. Baker.

■ The Senate investigation of Dave Beck and Teamster union finances is stirring up fresh proposals for strict accounting of union funds. The proposals range all the way from compulsory auditing and accounting by the government to the creation of voluntary "watchdog" committees by the unions themselves.

Senator McClellan, D., Ark., chairman of the Senate subcommittee, looking into Mr. Beck's money deals, says flatly the Senate won't legislate on the subject this year.

For Future Action—Next year, he predicts, the senators should have a more substantial idea of just what new laws are needed.

Here are some significant suggestions on what needs to be done:

Senator Case, R., N.J., says rank-and-file Teamsters (and presumably other unions, too) should impose a trust on their leaders.

United Auto Workers President Walter Reuther says he will ask the UAW in April to set up a public review board. The board will consist of civic leaders who will keep tabs on the actions of union officers.

A majority of top officers in the AFL-CIO Operating Engineers, on the other hand, have voted down a plan to force accounting of some



AT BAY: Dave Beck promises \$1 million campaign to clear his name.

union funds, it is reported. (This union is on Senator McClellan's list for investigation later this year.)

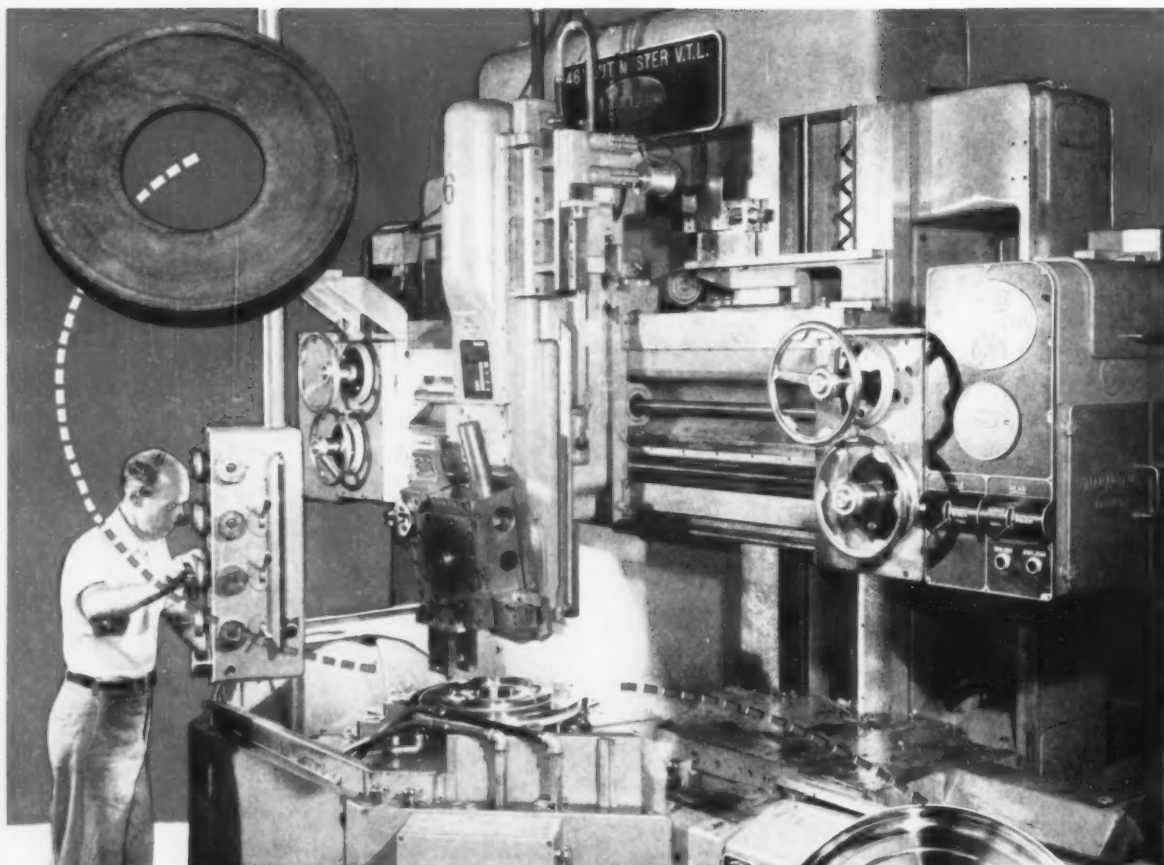
Action Inevitable—One thing's more certain with each passing day. Some form of control legislation now seems inevitable. The volume of rank-and-file mail arriving at the Capitol on the subject of union racketeering is still growing.

Check on Welfare Funds—One way to slow down racketeering in unions is to require publication of

the income and outgo of union welfare funds.

Under the present system, it's compulsory for most union members to contribute to welfare and pension funds, but union officials don't have to say where it goes.

Both Parties Agree—Leaders in both political parties are calling for new laws to require public disclosure of where the rank-and-file's pension and welfare contributions go. And Secretary of Labor Mitchell approves such plans.



"To produce quality parts in quantity . . .

Nothing beats Man-Au-Trol"

This statement by Mr. W. Mason Williams, Manufacturing Manager of the Jet Division, Thompson Products Inc., Cleveland, Ohio, is based on ten years of experience with Man-Au-Trol.

"If it hadn't been for Man-Au-Trol" Mr. Williams continues, "we would still be turning out aircraft engine components on manually-operated machines. Man-Au-Trol, particularly when tooled with better cutting tools, has enabled us to turn out at least five times as many compressor disc and turbine discs per shift as we produced on hand-operated equipment."

You, too, can apply to your machining problems the many advantages offered by Man-Au-Trol, Model 75 — just call your nearest Bullard Sales Office, Distributor or write for catalog to



BULLARD

THE **BULLARD** COMPANY

BRIDGEPORT 9, CONNECTICUT

Plastics Sales Heading Skyward

Farwestern Users Open New Markets

The industry is big business on the coast — hitting \$200 million a year in sales.

Reinforced plastics are major factor with growing use in construction and housing.

Here are reasons why plastics have such an important foothold in the area.—By R. R. Kay.

■ Sales of \$200 million per year. That's what plastics manufacturers on the West Coast are achieving. And half of this is in reinforced plastics.

Why does this industry keep skyrocketing in the Farwest? THE IRON AGE asked John Delmonte, president, Furane Plastics, Inc., Los Angeles, and a plastics pioneer on the Coast.

Testing, Testing—Mr. Delmonte sees a big new field for reinforced plastics. Where? In building construction and housing. Some projects are already using them.

Besides, new materials, new products, and new uses have a ready-made testing ground in aircraft and guided missile production. Both are major, booming industries in the area.

For bonding structures in missile manufacture plastics are making important headway. They can take the stresses and vibrations of hypersonic speeds.

Moving In—Structural adhesives have long been used in aircraft manufacture. Now they've invaded building construction. They're used for metal-to-wood assemblies and in the lumber industry.

If you're selling machinery, ma-

terial, or services, keep this in mind. Some 500 plastics manufacturers are in the 11 Western States.

No Boundaries—As the West Coast area grows, so will the plastics industry. Sales are not limited to the region. Manufacturers sell a healthy portion of their product east of the Rockies. And they're going after more sales there.

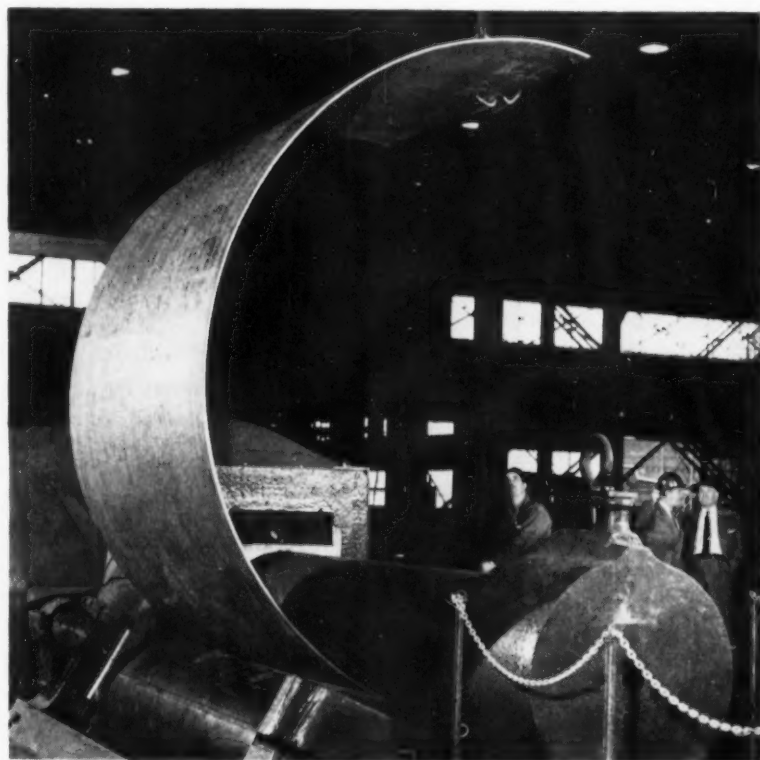
West Coast Briefs

Bonneville Power Administration is thinking about rate increases. Behind this are declining net revenues and high cost of new construction.

William A. Pearl, administrator, says it now takes more capital investment per kilowatt year of generating power.

Cheaper power for industry has Seattle's official blessing. The City Council adopted a new power rate schedule designed to encourage industrial users to avoid heavy demands during winter's peak months.

Boeing Airplane Co.'s \$21 million Seattle developmental center is now half finished. It will have a sizable area for office and manufacturing facilities for the Bomarc pilotless interceptors.



GIANT SQUEEZE: Known as heavy duty, pinch-type rolls, this equipment at Bethlehem Pacific's San Francisco shipyard can roll 10 ft wide cold steel plate 3½ in. thick into cylinder with ID as small as 36 in.



THIS is No Ordinary Power Hack Saw Blade

This is the *unbreakable* MARVEL High-Speed-Edge Hack Saw Blade—the first bi-metal blade—invented, developed and introduced by MARVEL. This blade is a combination of two materials best suited to the requirements of an efficient hack saw blade . . . a narrow high speed steel cutting edge permanently welded to a tough, non-brittle alloy steel body. Each blade is triple tempered to assure long life and maximum toughness to the cutting edge. Development of this high-speed-edge blade made it possible to cut any kind of material from the free machining steels to the toughest of alloys, fast, accurately and economically. Just one type blade to handle any job — no switching blades to cut different materials. Like all good things, attempted copies of this blade have been numerous, but its per-

formance has been *unequalled* by any of the imitators.

The MARVEL high-speed-edge hack saw blade can be tensioned from 200% to 300% tauter than any ordinary hack saw blade, a definite advantage which permits heavier feed pressures to be used without deflection or fear of breakage.

An extremely rugged cutting tool, this one type blade, the MARVEL High-Speed-Edge Hack Saw Blade, will cut any machineable metal with outstanding economy, accuracy, long life and complete safety—it is *unbreakable*.

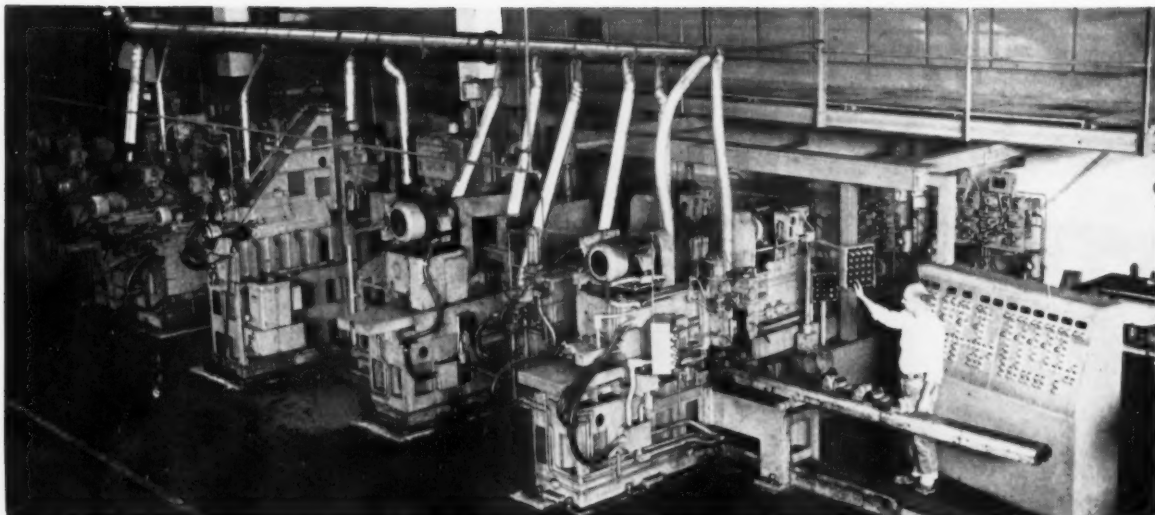
Ask for MARVEL Blades by name and you can be sure you're getting the best on the market. Leading Industrial Distributors have them in stock.

B-1120

Write for latest cutting tool Bulletin and
the name of your nearest MARVEL Distributor



ARMSTRONG-BLUM MFG. CO. 5700 W. Bloomingdale Ave., CHICAGO 39, U.S.A.



SPEED PLUS: This 12-station transfer machine at Reliance Electric saves labor, time and space.

Automation Reaches a New High

New transfer machine at Reliance Electric does the work of 15 machines.

Maximum speed and accuracy are set by automatic controls.
—By E. J. Egan, Jr.

■ A transfer machine that can handle machining of 36 different types of frames for AC motors is one of the showpieces at Reliance Electric & Engineering Co.'s new plant in Ashtabula, O.

The machine can't handle all 36 frames at one time, naturally, but it has quick changeover features. As few as 40 frames of any one size can be put through the line economically. It is a 12-station unit. Nine are operating stations, one is for loading, one is for unloading, and another a turnover station.

Replaces 15 Machines—A rough casting goes in at one end and comes out the other just about ready for use. En route it gets

faced, bored, milled, drilled and tapped. The only thing skipped is a rabbeting operation which is done manually.

Actually, the transfer unit does the work of a milling machine, 11 vertical turret lathes and a couple of multiple spindle drilling machines. Yet the company says it cost 25 pct less than the total price of the equivalent in standard machines.

Saves Manpower—Reliance officials also point to significant manpower savings with the new machining line. All its operations are supervised by just three men. To do the same machining job with standard equipment would take 15 operators plus some setup men.

Everything about the new transfer machine is automatically controlled for maximum speed and accuracy. Average production, depending on frame size, is about a frame a minute. But to avoid needless inventory buildup, no one frame size ever gets a very long run. That's where the quick

changeover features come in handy.

Easy Setup Check — Changing the same diameter frame from one length to another takes about an hour. Switching a totally enclosed to an explosion-proof enclosure takes about an hour, also.

M & M, Avey Merge

Merger of Motch & Merryweather Machinery Co., Cleveland, and The Avey Drilling Machine Co., Cincinnati, was announced last Friday by the respective company presidents, R. W. Banfield and D. A. Patterson.

You can look for a much more aggressive sales and design philosophy as a result. Mr. Banfield is a former Pratt & Whitney Div. executive VP who joined M & M in January. He told THE IRON AGE, "We are going to intensify our efforts in the special automated equipment field—automotive, aircraft, appliance, electrical, farm equipment and other high production industries."

INDUSTRIAL BRIEFS

Washington Scene — John Farr Simmons, recently retired as Chief of Protocol for the Dept. of State and for the White House, has been appointed Washington assistant to W. Cordes Snyder, Jr., president of Blaw-Knox Co., Pittsburgh, Pa.

On Location — "How To Select the Right Grinding Wheel" is a 16mm sound and colored motion picture. The film depicts grinding wheel specifications for two different and specific grinding jobs. A special condensation of the film story is available as a handout piece to audiences. For bookings, contact Norton Co., Worcester, Mass.

Three for One—Two divisions of H. K. Porter Co., Inc.; Laclede-Christy, St. Louis, and McLain Fire Brick, Pittsburgh, have been combined under common management. To be known as the Refractories Div., it also will bring under the one management the newly acquired Mullite Refractories, Shelton, Conn.

Fair Trade — Republic Steel Corp. is transferring its plastic pipe manufacturing operations from its Cleveland Pressed Steel Div. plant to its Elyria, O., Pressed Steel plant, and its stamping operations from Elyria to Cleveland. The move will consolidate operations under one roof while finding adequate space to meet the growing demand of plastic pipe.

Centralize Research—Allegheny Ludlum Steel Corp. will construct the first of three new buildings which will be built this year at the company's research and development laboratory in Brackenridge, Pa. Two buildings are already on the site. With the addition of two laboratory buildings and an administrative building this year, it will make it possible for the company to centralize all its research facilities at this location.

Wide Market — All Andrex equipment for industrial radiography will be marketed and serviced in the U. S. exclusively by Picker X-Ray Corp. The San Francisco offices of Holger Andreasen, Inc., manufacturer of this equipment, will be discontinued.

Kaiser Goes into Kitchen — Kaiser Metal Products, Inc. has signed a contract to supply a complete line of steel kitchen cabinets to Whirlpool-Seeger Corp. Production is underway on a range of styles and sizes of cabinets for the St. Joseph, Mich. firm. Deliveries will be made to eighty RCA Whirlpool distributors. Cabinets will be marketed along with other appliances manufactured by Whirlpool-Seeger, under the trade name RCA Whirlpool.

Locked Up—The Lylok Corp., Paramus, N. J., has licensed Lamson & Sessions Co., Cleveland, to produce its patented line of self-locking screws and bolts. The process involves inserting a nylon plug into a hole drilled in the threaded area of the fastener.

Line Lengthened—The Dumore Co., Racine, Wis., will purchase the manufacturing and sales rights for a line of portable precision machining units known as Versa-Mil. To be known as the Dumore Versa-Mil, the machine is an attachment for lathes and other machine tools. Primarily used for milling, it will also drill, bore, cut interval keyways and grind both internally and externally by adding various interchangeable accessories.

Million to Modernize — Borg-Warner Corp. plans to invest approximately \$26 million in new plants and modern equipment this year. This total is expected to boost to nearly \$160 million the amount of capital expenditures made by the company since World War II.

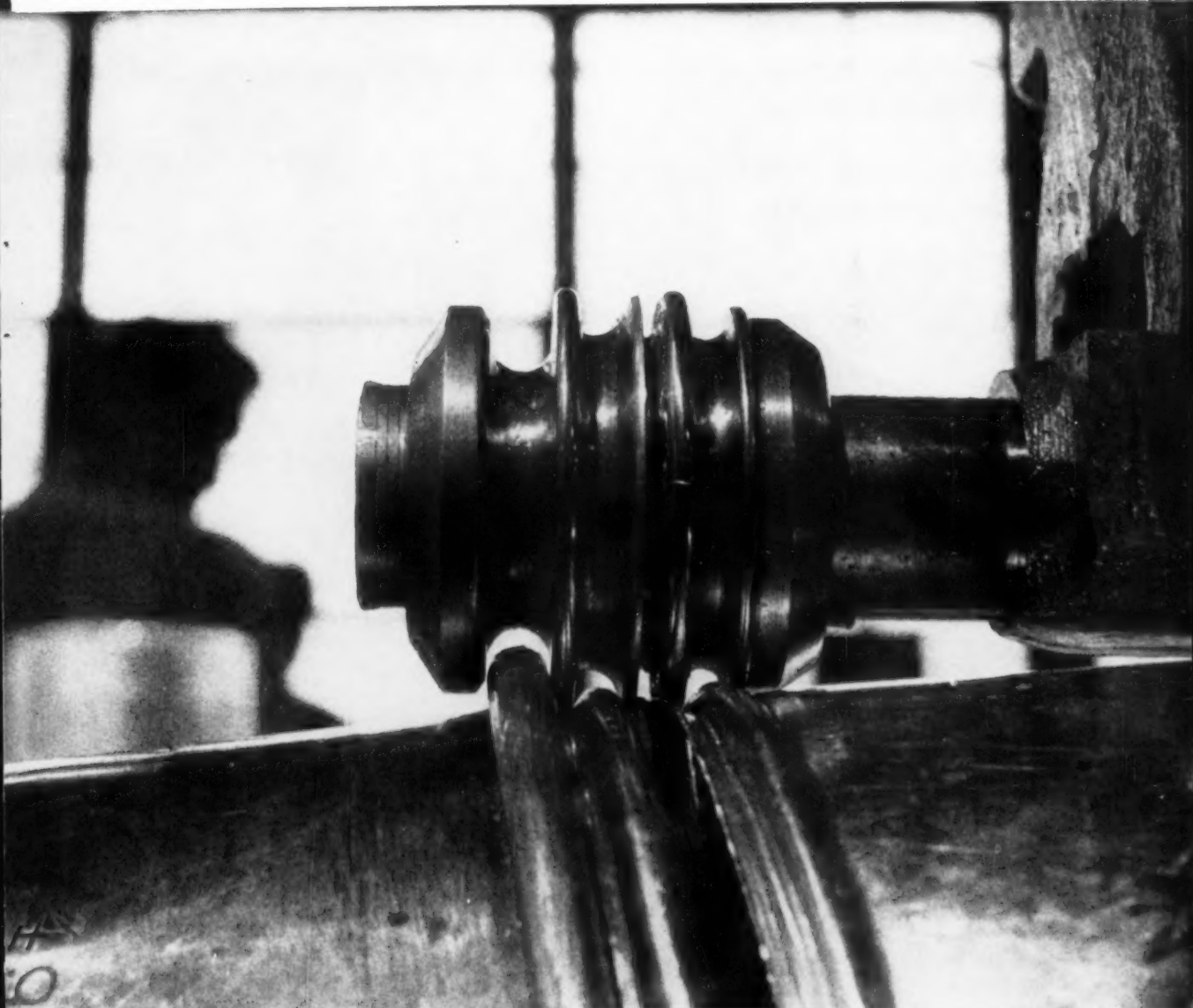
Co-Pilots — The U. S. Atomic Energy Commission has signed a one-year contract with Ramapo Uranium Corp. of New York City. Agreement is to purchase at \$8 per lb uranium oxide in uranium concentrates produced in a pilot plant operated by the company at Warwick, N. Y. The minimum quantity that may be purchased under the contract is 50,000 lbs of U_3O_8 .

Shear Profit—The Lowey-Hydro-press Div. of Baldwin-Lima-Hamilton Corp., New York, has been awarded a multi-million dollar contract by U. S. Steel Corp. It is to design, build and install Cold Structural Shears, Inspection Beds, and a Roller Table System for U. S. Steel's new structural mill now under construction at South Works, Chicago.

Traveling Companion — The 1957 Automobile Repair Manual published by the Book Div. of Chilton Co., Phila., is now available. This book covers every make and model from 1940 to date and provides information essential to repair shops and do-it-yourself fans. Chilton's manual has sold over 3 million copies to automotive people in the 48 states and 25 foreign countries.

Engineering "Oscar"—E. G. de Coriolis was named "Engineer of the Year for 1957" by the Toledo Technical Council at the Sixth Annual Engineers' Week Banquet. Mr. de Coriolis is an author and holder of many patents in the industrial heating field. He has been director of research for Surface Combustion Corp. for the past quarter of a century.

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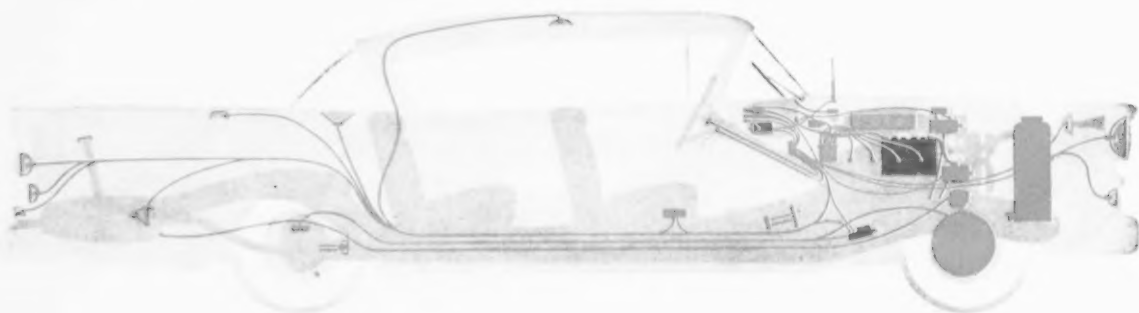
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Robert W. Biggs, elected president, **S. K. Wellman Co.**, Bedford, O.; **C. T. Cox**, elected vice president and secretary-treasurer; **W. E. Canfield**, elected vice president, sales.

Samuel Storchheim, elected president and technical director, **Metals Research & Development Corp.**, Exeter, Pa.

V. A. Christensen, named superintendent, new construction, **Bethlehem Pacific Coast Steel Corp.**, San Francisco.

Joseph J. Vannuki, appointed division accountant, **Truscon Steel Div., Republic Steel Corp.**; **Gerald C. Duerr**, named division accountant, **Berger Div.**, Canton, O.



John W. Price, Jr., named general superintendent, **Edgar Thomson Works, U. S. Steel Corp.**



D. R. Mathews, named general superintendent, primary production, **Alan Wood Steel Co.**

A. J. Williamson, elected president, **Tube Reducing Corp.**, Wallington, N. J.

John S. Billingsley, named asst. to vice president, sales, **Crucible Steel Co. of America**, Pittsburgh.

Andrew B. Pulliam, elected vice president and general manager, **Marvel - Schebler Products Div.**, Decatur, Ill.; **Borg-Warner Corp.**

Benjamin J. Davis, elected vice president and general manager, **Athol Machine & Foundry Co.**, Athol, Mass.



Clifford B. Brundage, Jr., named asst. general superintendent, **Duquesne Works, U. S. Steel Corp.**

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R. K. Handley, elected vice president, **Iron Fireman Manufacturing Co.**

James E. Hiff, elected vice president and general manager, **Davidson-Kennedy Associates Co.**, Chicago office.

John D. Grayson, named controller, **J. I. Case Co.**, Racine, Wis.

Joseph M. Johnston, named operations superintendent, instruments and components, **The Victoreen Instrument Co.**



Charles C. Thomas, appointed manager, construction engineering, systems application engineering section, **User Industries Sales Dept., General Electric Co.**, Schenectady, N. Y.

Edmond J. Walsh, named manager, manufacturers products sales, **American Steel & Wire Div., U. S. Steel Corp.**

Donald E. Rice, appointed general manager, operations, **Columbia-Geneva Div., U. S. Steel Corp.**, San Francisco.

Murray Medvin, elected executive asst. to the president, **Gulton Industries, Inc.**, Metuchen, N. J.

B. T. Bowlin, R. L. Burton, P. B. Clarke, M. E. Eliot, and J. N.

Meyer, elected vice presidents, Mosher Steel Co.; R. L. Moore, elected secretary and treasurer; T. T. Harrison, elected controller and asst. secretary and treasurer.

L. L. Bechler, named marketing manager, Electric Motor Development Co., Wickliffe, O.

John A. Howell, named sales metallurgist, Rolled Alloys, Inc., Los Angeles.

Charles J. Simon, named manager, sales, industrial television, Technical Products Dept., General Electric Co., Syracuse, N. Y.

Robert H. Howard, named asst. to director, general planning, Kaiser Steel Corp.

Frank G. Daveler, named division manager, Computer Components Div., International Resistance Co., Philadelphia.

Richard C. Walsh, named manager, Green Bay, Wis., branch sales engineering office, American Blower Div. of American-Standard, Detroit.

Vincent P. Masi, named manufacturing manager, Mound Road Engine plant, Chrysler Corp., Detroit; Howard H. Schrock, named manufacturing manager, Trenton Engine plant.

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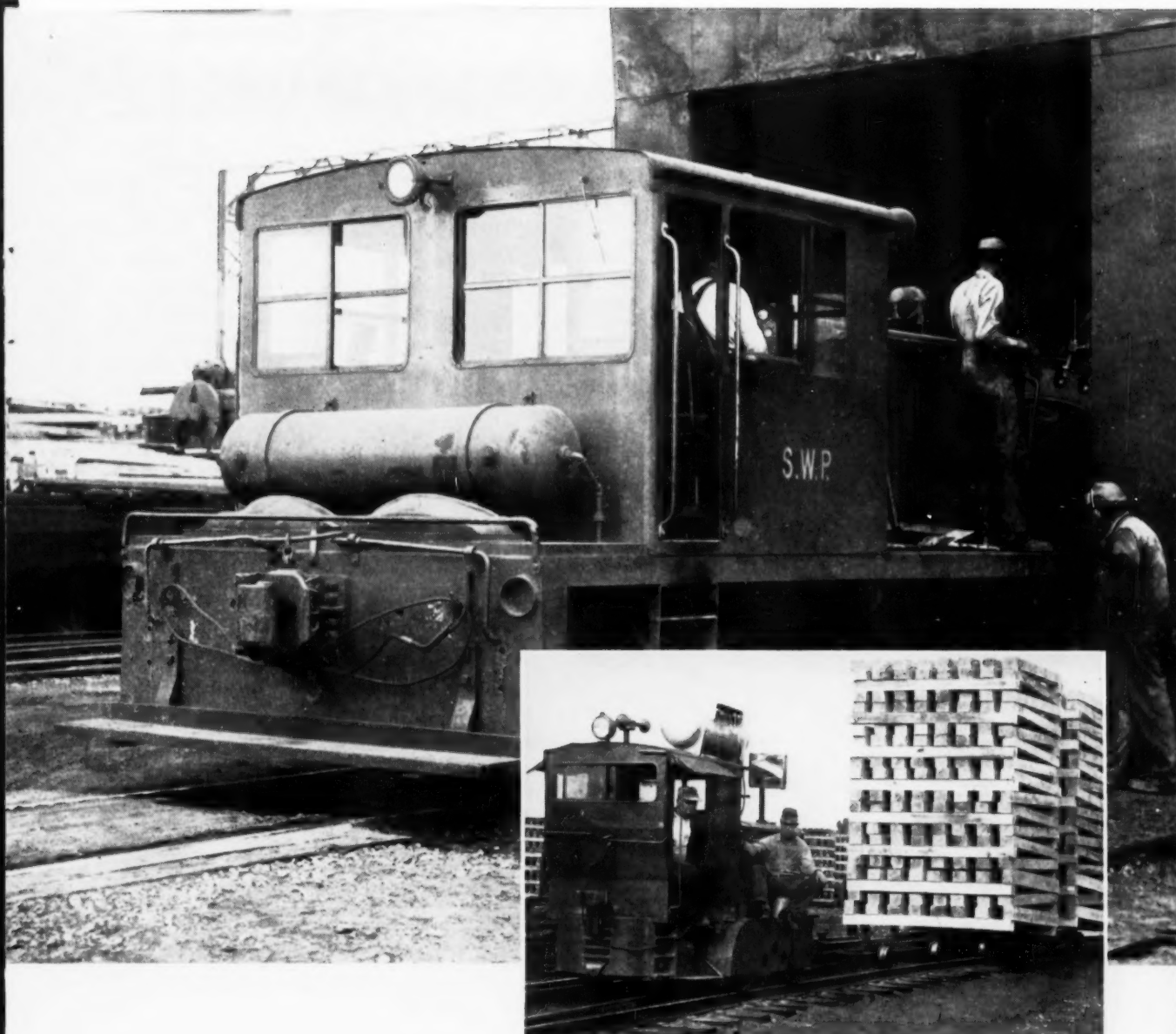


Dr. Hubert J. Pessl, named director of Research and Education, Allsteel Press Co., Chicago.



Paul Cain, named director, industrial engineering, Armco Steel Corp., Middletown, O.

Arthur A. Kappenhagen, appointed division superintendent, steel plant, Youngstown district; Republic Steel Corp.; Joseph Turner, named superintendent, open-hearth furnaces; M. L. Stambaugh,



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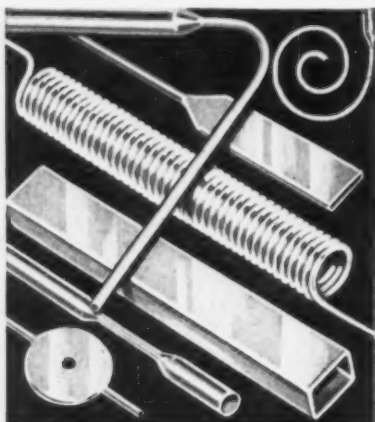
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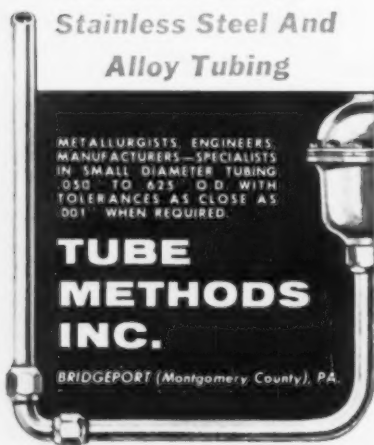


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Charles H. Luikart, named Cleveland product representative, aluminum sales, U. S. Steel Supply Div., U. S. Steel Corp.

Henry J. Wallace, named vice president, sales, National Tube Div., U. S. Steel Corp.

William Lehr, named manager, Atlanta district sales office, Tubular Products Div., **The Babcock & Wilcox Co.**, Atlanta, Ga.

Rodney R. Burns, named asst. to manager, Sheet Sales Div., **Pittsburgh Steel Co.**

Malcolm Reed, **George G. Davis**, **Mark S. Scheibert** and **Carl Funk**, appointed supervising industrial engineers, **Armco Steel Corp.**, Middletown, O.



E. W. Merry, named group vice president, Industrial Products Group, **Mine Safety Appliances Co.**, Pittsburgh.

Elmer F. Lefvina, named chief clerk and buyer, Cleveland-Pittsburgh district, **American Steel & Wire Div.**, **U. S. Steel Corp.**

James C. Cameron, named manager, market research, **Wolverine Tube Div.** of **Calumet & Hecla, Inc.**, Detroit.

Chalmers L. Goyert, named director, product planning office, **Ford Motor Co.**, Dearborn, Mich.

Norman C. Peskin, named sales engineer, SR-4 devices and systems, New England, Electronics and Instrumentation Div., **Baldwin-Lima-Hamilton Corp.**



William E. Connor, named sales engineer, Machinery Div., **Dravo Corp.**, Pittsburgh.

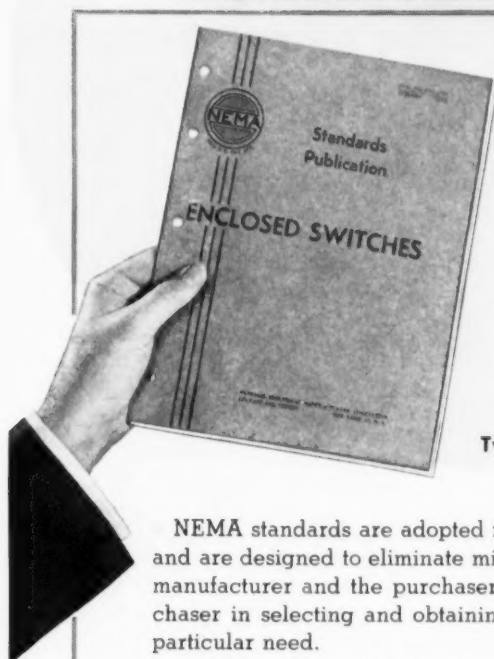
Thomas P. Slesman, appointed district sales manager, Steel Tube Dept., **Hofmann Industries, Inc.**, Sinking Spring, Pa.

Ralph J. Davidson, appointed sales representative, Heating Controls Div., **Robertshaw-Fulton Controls Co.**

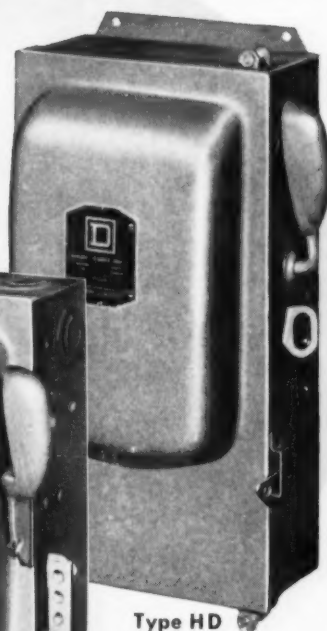
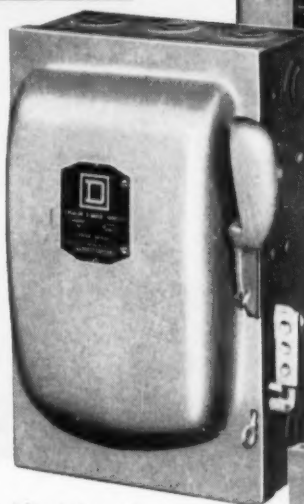
Howard J. Luetzow, appointed technical sales representative, Chicago and surrounding areas, **Wolverine Tube Div.** of **Calumet & Hecla, Inc.**, Evanston, Ill.

William J. Fath, named works manager, **The Hydraulic Press Mfg. Co.**, Div. of **Koehring Co.**, Mount Gilead, O.; **Warren E. Beck**, named production control manager; **A. I. Wallace**, named asst. production

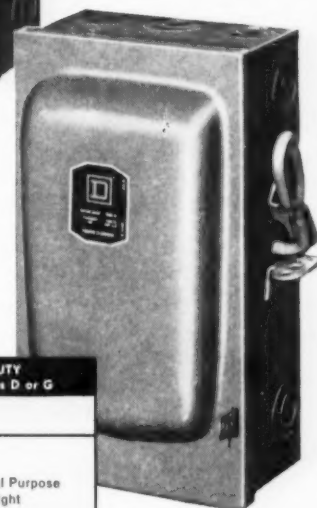
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control manager.

Edward L. Boersig, named manager, component sales, **General Electric Co.**, Detroit.

A. R. Kratzberg, named manager, Metal Fabrication Div., **Fluor Products Co.**, Paola, Kansas.

David L. Richardson, Jr., named staff industrial engineer, **Jones & Laughlin Steel Corp.**



C. M. Donahue, named group vice president, Mining Products and International Group, **Mine Safety Appliances Co.**, Pittsburgh.

Richard L. Horn, appointed field test engineer, Michigan area, Grinding Wheel Div., **Electro Refractories & Abrasives Corp.**, Buffalo, N. Y.

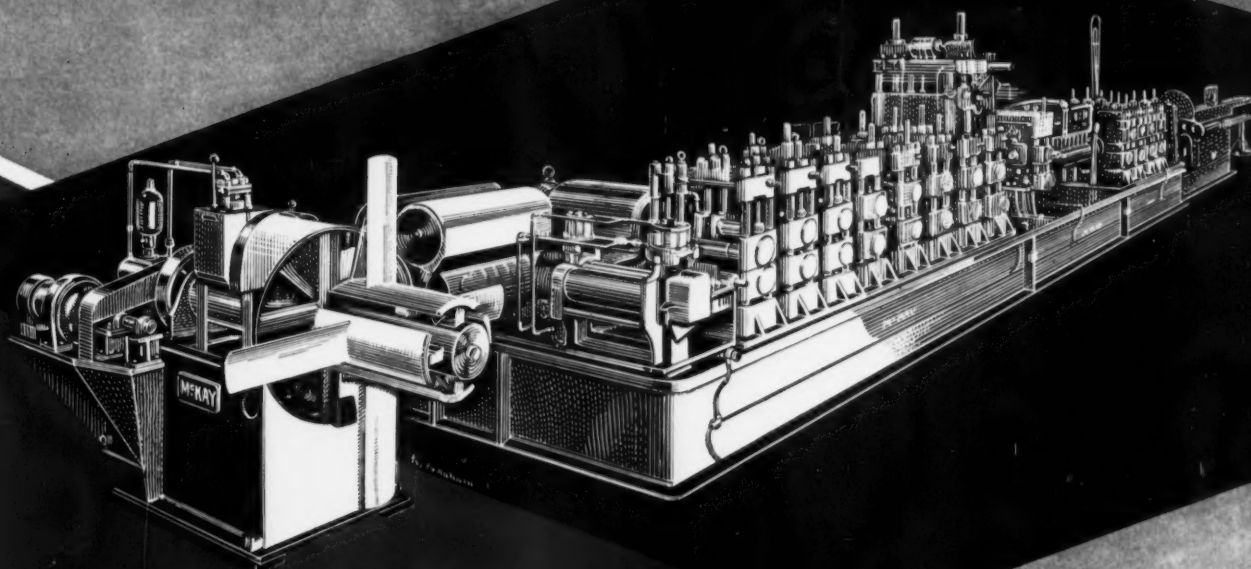
R. Rosslyn Penney, appointed manager, Montreal office, **Kurt Orban Canada, Ltd.**

Thomas L. Douglas, appointed senior sales engineer, Finn Aeronautical Div., **T. R. Finn & Co., Inc.**, Hawthorne, N. J.

W. C. Worley, named district manager, Detroit sales office, **Weirton Steel Co.** Div. of National Steel Corp.

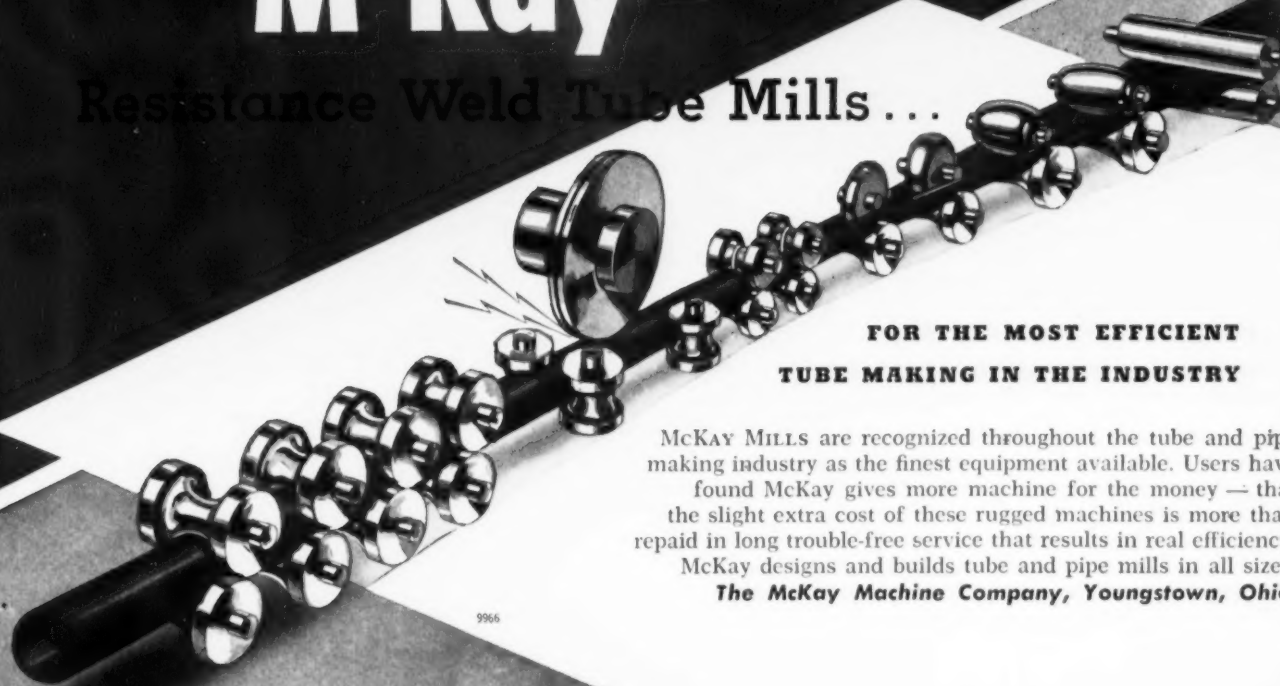
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Richard E. Hoverter, named technical service engineer and **Kenneth W. Raymond**, named specialist, product development, West Coast



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Carl J. Oxford, Jr., named director, research, **National Twist Drill & Tool Co.**, Rochester, Mich.

Fred C. Ruff, named regional engineering representative, **Huck Manufacturing Co.**, Minneapolis.

W. J. Rutherford, named aviation sales manager, **General Logistics**, Pasadena, Calif.



Milo L. Phillips, appointed sales manager, **Alloys & Chemicals Manufacturing Co.**, Cleveland.

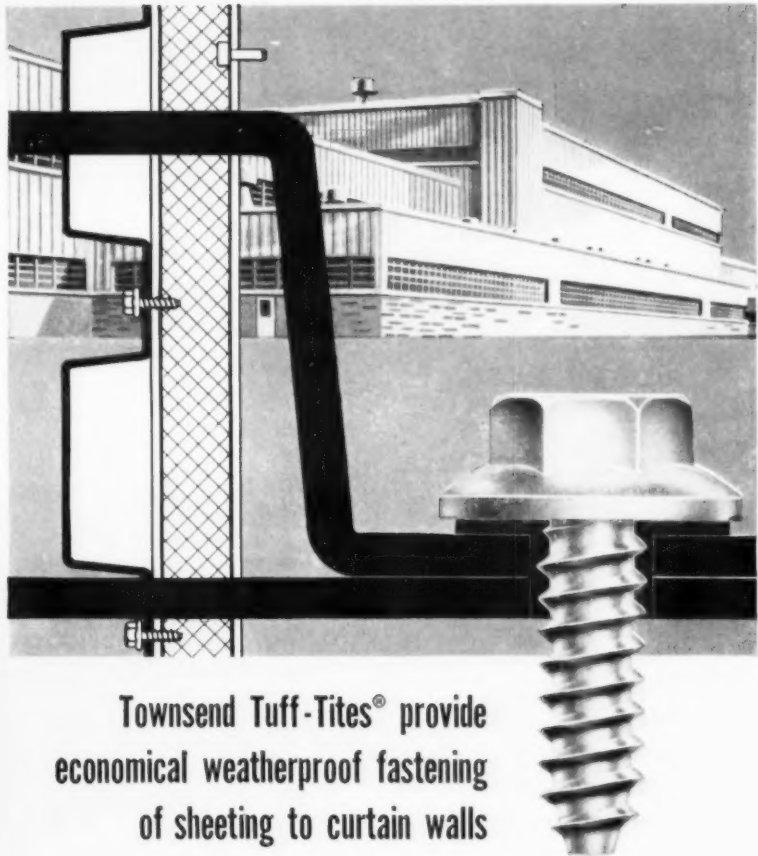
G. Whitney Snyder, named asst. general sales manager, Product Divisions, **Crucible Steel Co. of America**; **Robert M. Simpson**, named asst. general sales manager, Field Sales.

OBITUARIES

C. D. King, asst. to executive vice president, operations, **U. S. Steel Corp.**

John R. Fulton, 44, vice president, **Wheelock Lovejoy and Co.**, Cambridge, Mass.

Walter Hugust Gaither, Jr., 53, general manager, Green Bag Cement Div., **Pittsburgh Coke & Chemical Co.**



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For more information on these economical, weatherproof fasteners, write to Townsend Company, P.O. Box 237-A, New Brighton, Pa., asking for Bulletin TL-107a.

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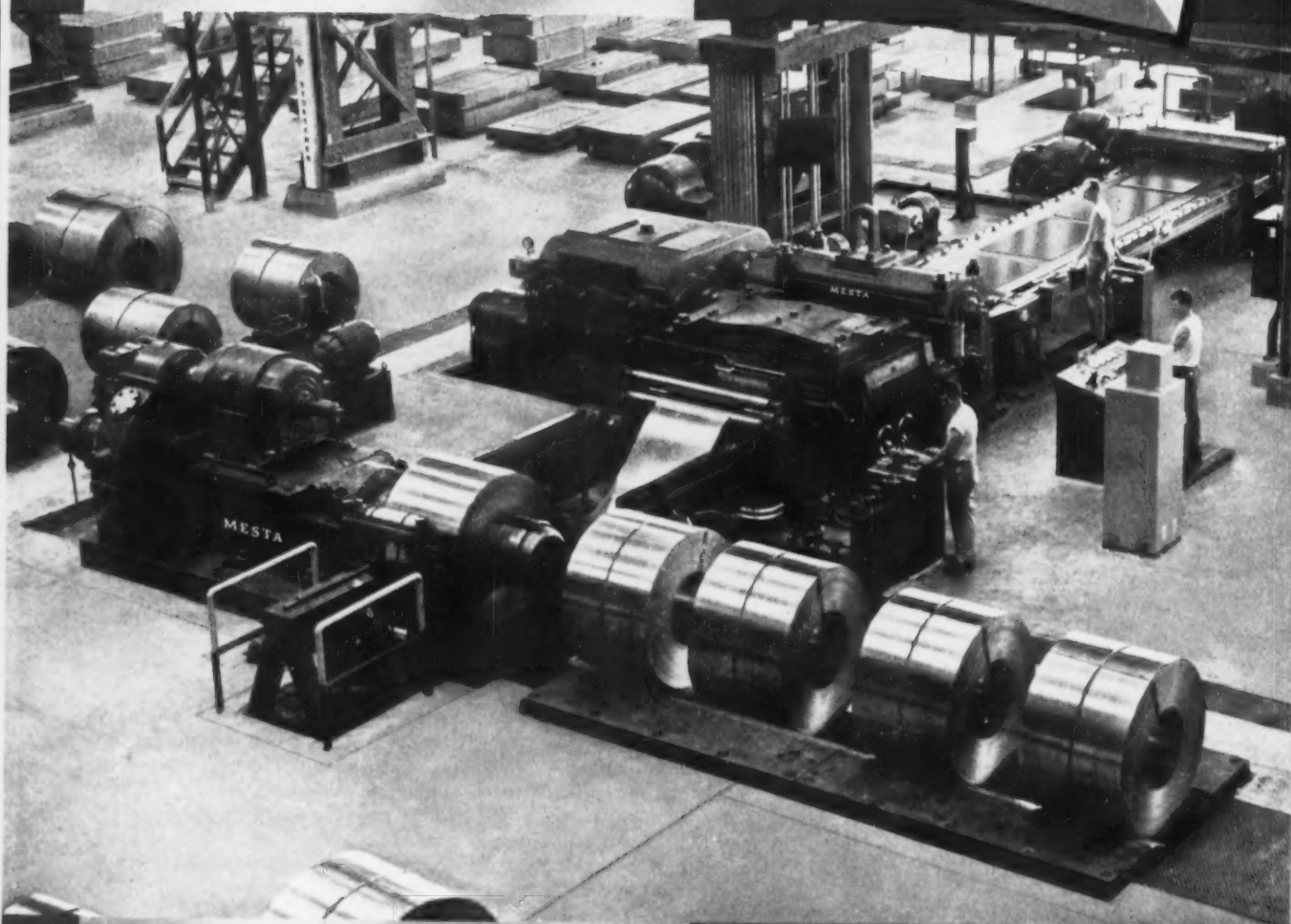
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Rating System Simplifies Welding Electrode Selection

By O. T. Barnett, Assistant Manager, Metals Research Dept., Armour Research Foundation, Illinois Institute of Technology, Chicago.

Nine coated electrode specifications cover just about every requirement for manual arc welding mild steel.

Each has its advantages and disadvantages under specific conditions.

Rating the factors which affect performance makes electrode selection a simple matter.

■ Among industrial products, there's a continual Darwin-like process going on. Usually more products perish than survive. But with coated manual arc welding electrodes for welding mild steel, the reverse is true. To those who haven't lived through the weeding out period, this may seem baffling.

Recently, the ASM Committee on Selection of Electrodes reviewed this subject. It worked out rating factors which simplify the problem of choosing the best electrode type for each application. These rating factors are used here but incorporate a number of changes in industrial practice.

Nine Types—The electrode classifications listed in Table I take care of all carbon steel welding requirements. Two electrode classification numbers in the current AWS-ASTM specification, E6015 and E6030, are not listed because their use has virtually ceased. The E60LI is a low-hydrogen iron powder electrode that is growing in popularity. It is so new, however,



BUTT SEAM: Welder makes joint fast using contact-type electrodes.

that it has no classification number as yet.

There are two to three different designs of E6012 electrodes. Also, two E6013 coating types exist. And in the E60LI style, there are fraternal rather than identical twins. Likewise, there are operational shades of interpretation of electrode designers.

What Specs Mean—For mild steel welding, all of these electrodes provide tensile strength of more than 60,000 psi. This explains the "E60" part of the specification. The third number "1" suggests all posi-

tions of welding: flat, horizontal, vertical and overhead. Similarly, a third number "2" is restricted to the flat and horizontal positions. Frequently, the third and fourth numbers are considered together to cover welding positions and type of coating.

The seeming irregularity where the E60LI may be used for all-position welding or flat and horizontal alone is explained by the two distinctly different coating compositions. Another peculiarity is that there are few E6016 brands as compared with the E7016 prod-

TABLE I

MILD STEEL ELECTRODE CLASSIFICATIONS

AWS-ASTM Classification Number	Coating Type	Current	Welding Position
E6010	Cellulose—Na	DCR	All
E6011	Cellulose—K	DCR, AC	All
E6012	Titania	DCS, AC	All
E6013	Titania—K	DC, AC	All
E6016	Low Hydrogen—K	DCR, AC	All
E60L1	Low Hydrogen—Fe Pwdr	DCR, AC	All or F, H
E6020	Iron Oxide	DC, AC	F, H
E6024	Titania—Fe Pwdr	DC, AC	F, H
E6027	Iron Oxide—Fe Pwdr	DC, AC	F, H

ucts. Fortunately, these may be used interchangeably. Also, most iron powder electrodes have mechanical strengths in the E70XX or higher range which will not adversely affect their use on low carbon steel.

Easy Choice—To be sure that you consider all welding variables in selecting the best electrode type for a specific job, use the rating factors for each variable. Table II does just this. The welding supervisor can transfer these factors to

individual cards. By picking out the appropriate cards (or from the table), he can add up the score for the eligible electrode classes.

The table gives the rating factors for the nine electrode groups as applied to heavier butt welds in the flat position. The thickness of the base metal is important to provide enough heat capacity for the high current electrodes generally deposited in such joints. Excellent deposition rates, X-ray clean weld metal and well-balanced mechanical properties developed the ranking listed.

Big Difference—When the same type of joints must be made in the vertical, horizontal or overhead positions, electrode selection changes radically. You'll note that three electrode groups have been dropped. Lately, the E60L1 all-position electrode has hung up

TABLE II

HOW ELECTRODES RATE

AWS-ASTM CLASSIFICATION NUMBER	Butt Welds F Position		More Than $\frac{5}{16}$ in. Butt Welds—V, H, or D Positions—More Than $\frac{5}{16}$ in.		Fillet Welds F or H Positions		Fillet Welds V or O Positions		Type of Current			Thin Material Less Than $\frac{1}{4}$ in.	Thick or Restrained Joints	High Sulfur Free-Machining Steel	Deposition Rate	Penetration	Appearance, Undercutting	Soundness	Ductility	Low-Temperature Impact Strength	Freedom from Spatter	Bridging Gaps (Poor Fit-up)	Welder Appeal	Ease of Slag Removal*
	4	10	2	10	AC	DCS	DCR																	
E6010	4	10	2	10			X	5	8	—	5	10	6	6	6	8	2	6	7	10				
E6011	5	9	3	9	X		X	7	8	—	5	9	6	6	7	8	1	7	6	8				
E6012	3	5	8	6	X	X		8	6	5	7	6	8	3	4	4	6	10	8	6				
E6013	8	8	7	7	X	X	X	9	—	3	7	5	9	5	5	5	7	8	9	8				
E6016	7	7	5	8	X		X	2	10	10	5	7	7	10	10	10	6	4	6	4				
E60L1	9	6	7	6	X		X	2	9	9	8	7	10	8	10	10	8	4	8	7				
E6020	10	—	10	—	X	X	X	—	8	—	9	8	9	9	10	8	9	—	9	8				
E6024	9	—	10	—	X	X	X	7	7	5	10	4	10	8	5	9	10	8	10	8				
E6027	10	—	7	—	X	X	X	—	8	—	10	—	10	9	10	9	10	—	10	8				

* E6010 and E6011 have a rating factor of 10 on coated steels.

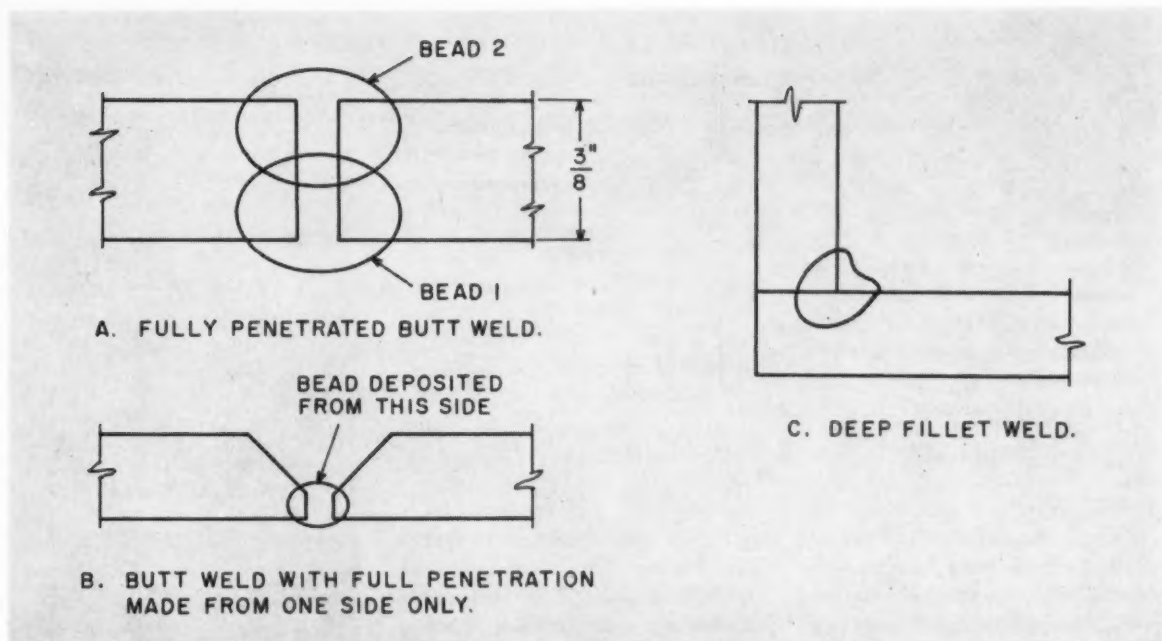


FIG. 1: Penetration has a special significance in certain welding applications. Here are three particular

uses showing joints where proper penetration is important to the securing of sound weld joints.

some enviable speed and quality records.

Fillet welds have more heat capacity than butt welds of the same base metal thickness. This leads to the alignment of rating factors given in Table II. Base metal ought to be at least $\frac{3}{8}$ in. thick or the E6020 classification will have to drop lower in the line-up. The E6024 classification can easily be a stand-out. Here, too, speed and quality are the principal points.

AWS Holds 5th All-Welding Show

The welding industry, about 15,000 persons strong, will converge on Philadelphia starting April 8 for the 5th All-Welding Technical Meeting and Show.

Technical sessions, extending from April 8-12, will cover not only the practical aspects of welding, but of brazing, soldering, and cutting as well.

More manufacturers will exhibit their products and processes than in any previous show. Thus far, they number 113, occupying 150 booths. Many will show new and improved products.

Fillets Similar — When fillet welds climb straight up as in vertical welding, they are first cousins to butt welds in the same position. The similarity is quite obvious in the table. This brings home the strong influence of welding position on electrode selection. Since the slowest electrodes must be used for vertical welding, the use of positioners to permit flat position welding is certainly a justified investment.

Originally, the type of current used and the choice of electrode had a "chicken-or-egg" relationship. Now it doesn't matter as there are electrodes for any power source.

All electrode groups except the E6010 type can be used either with alternating current or with direct current. Since the E6011 classification matches E6010 performance very closely, this is not a severe handicap. E6011 electrodes work better with direct current-reverse polarity (DCR) than they do with direct current-straight polarity (DCS). The same thing is true of the E6016 design. The reverse situation prevails with the E6012.

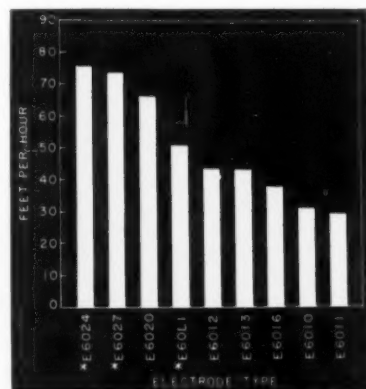


FIG. 2: Relative 1-pass speeds for DC-made horizontal fillet welds (3/16 or 5/16-in. mild steel electrodes).

Faster With DCS — Wherever either polarity is permissible, direct current straight polarity is likely to speed welding at the same current setting. Sometimes, alternating current is chosen to avoid magnetic disturbances due to heavy welding currents or joint locations. Usually, settings for alternating current are higher than for direct current which makes the deposition rates equal.

Joining sheet metal by arc welding puts a premium on arc stability.

TABLE III SELECTION OF BEST ELECTRODE FOR PIPELINE WELDING

	E6010	E6011	E6012	E6013	E6016	E60L1
Butt welds, V, H or O > 1/8 in.	10	9	5	8	7	6
Deposition Rate	5	5	7	7	5	8
Penetration	10	9	6	5	7	7
Soundness	6	6	3	5	10	8
Ductility	6	7	4	5	10	10
Welder Appeal	7	6	8	9	6	8
Easy Slag Removal	10	8	6	8	4	7
Totals	54	50	39	47	49	54

Here, the electrodes with stable arcs at low currents head the ratings. A favorite way of getting arc stability with alternating current is through the potassium chemicals in the coating. Good alternating current arc stability carries over into direct current as well. So the types usually recognized as alternating current electrodes run ahead of their direct current counterparts.

Examples are the choice of E6013 over E6012 and E6011 over E6010. Two distinct mechanisms are involved. With the E6013 and E6012 electrodes, bead deposition is emphasized. With the E6011, and even more so with the E6010, the electrodes furnish heat for melting the edges of the base metal together as in an edge or lap weld.

Go to LH Types—When thick or restrained joints are to be welded, other rating factors prevail. Now the emphasis is on "blue-brittle" ductility and the ability to deposit a thicker bead on the first pass. The low-hydrogen types E6016 and E60L1 have excellent ductility at about 600°F where other electrode types are apt to be crack-sensitive.

Gas-shielded E6010 and E6011 classifications permit the deposition of thicker first passes which also solidify quickly. Thus heavy, restrained joints are bound together with stout, crack-free tack welds or initial passes. Experience has proven the value of E6010 and E6011 weld deposits when the

going is rough enough to crack some welds wide open.

E6020 and E6027 molten pools of weld metal covered with a heavy insulating slag blanket cool very slowly. For this reason, they were the mainstay of heavy welding before submerged arc welding. Often, the back sides of heavy butt welds were held together with stout tack welds made with E6010 or E6011 electrodes until a sufficient thickness of solidified E6020 or E6027 weld metal could be built up.

Open Gap for T's — In certain tee joints where a heavy one-pass fillet of E6020 or E6027 weld metal is deposited on each side of the vertical member, allowance is made for stress dissipation by leaving a slight gap during fit-up. The first weld draws the two parts together with almost no stress build-up. The second weld has virtually no locked-up stress restraint to overcome in addition to the usual shrinkage stresses.

A lower rating for the E6024 and E6012 groups of electrodes does not reflect either "blue-brittle" crack-sensitivity or the deposition of a thin first pass. This rating springs from the fact that the rutile-base electrodes tend to produce porous multi-pass welds. They are seldom used for thick joints. Their best use is for high-speed single-pass joints where they produce gas-free deposits of acceptable quality.

TABLE IV SELECTION OF BEST ELECTRODE FOR POWER SHOVELS

	E6010	E6011	E6012	E6013	E6016	E60L1	E6020	E6024	E6027
Thick or Restrained Joints	8	8	6	—	13	9	8	7	8
Deposition Rate	5	5	7	7	5	8	9	10	10
Soundness	6	6	3	5	10	8	9	8	9
Ductility	6	7	4	5	10	10	10	5	10
Low Temp. Impact Strength	8	8	4	5	10	10	8	9	9
Totals	33	34	24	22	45	45	44	39	46



BACKING IT UP: Instructor points up electrode theory with example.

Lime Base for Sulfur — A restricted rating group has been established for high-sulfur free-machining steels. Here, too, the low-hydrogen lime-base electrodes get along very well with the troublesome sulfur (from a welding viewpoint).

The other three electrode classifications have much lower ratings. They can make satisfactory welds under some conditions but offer all the hazards of sending boys to do the work of men. Sulfur causes weld bead cracks due to hot-shortness as well as the deep pock-marks of numerous surface holes.

Cost reductions make production heroes. For this reason, the comparative deposition rates in Table II are especially significant. The iron powder electrodes, E6027,

E6024 and E60LI, take three out of four top places. While the iron powder electrodes cost more per pound, they generally save tidy sums in terms of cost per welded joint.

E6020 Loses Lead — Heavily coated E6020 electrodes show up next to the top because they've relinquished their leadership to the more heavily coated electrodes carrying powdered iron in their chemical coatings. This is particularly true of downhand and horizontal fillet welding. The five remaining groups are still slower. But welding of sheet metal or vertical joints would scramble the speed ratings. Specific values at maximum direct current settings are given in Fig. 2.

Penetration has a special significance in some applications. Before considering the reasons for the ratings, it's well to keep in mind that penetration of metallic arc welding electrode weld deposits is always good enough to produce good bonding. Therefore, penetration has no significance as applied to wetting or joining of the weld deposit to the base metal. Instead, there are three particular uses of penetration as shown in Fig. 1.

Weld to Full Depth—By gapping butt joints of $\frac{3}{8}$ in. thickness or less, the digging or deep penetrating arcs of E6010 and E6011 electrodes can produce a complete weld metal joint without back chipping. Or when welding pipelines from one side only where full penetration is desired, the penetrating and quick solidifying qualities of these two electrodes prove to be most useful.

For fillet welding, the deep penetrating qualities of E6020 welding electrodes result from high currents, close arcs and fairly rapid travel speeds. While the lime-base electrodes, E6016 and E60LI, exhibit good penetrating qualities, too, these classifications and the remaining ones are seldom chosen for penetration factors.

Appearance and undercutting might be considered as hallmarks

of welding craftsmanship. Skilled manual welders can deposit weld beads of machine-like uniformity. Further evidence of welding skill is found in freedom from undercutting. But skills vary. The ratings become important by helping all welders to make top-quality welds.

Get Rid of Undercuts—Smooth, closely rippled beads are characteristic of weld metal laid down by E6027, E6024 and E60LI electrodes. E6020 and E6013 welds are close seconds as fillet welds but somewhat less outstanding as butt welds. Ripples coarsen rapidly with electrodes placed lower on the list.

Undercutting has caused many welding superintendents to turn prematurely gray. Inspectors are prone to yellow-chalk undercuts and call for expensive repairs because undercuts are stress raisers. E6020 electrodes can undercut the top leg of horizontal fillet welds. E6010 and E6011 electrodes can undercut almost any joint in every position except the downhand. Such dangers can be readily detoured by proper choice of classifications.

Soundness is influenced by porosity, cracks, slag inclusions, microfissures and underbead cracking. All of these considerations have been combined to establish the rating factors. For example, the E6016 leader may exhibit some porosity if the coating is slightly moist, if the arc is too long, or if the joint is made against an open gap for the first pass. Unless excessive, however, porosity has very little effect on mechanical properties.

Choice for Soundness — Weld metal cracks are practically unknown with lime-base electrodes. Slag inclusions are rare. Microfissures, oftentimes called birds-eyes, fisheyes and the like, are noticeably absent. This is due to the low-hydrogen qualities of E6016 weld deposits. Underbead cracking, another hydrogen-source defect, does not occur either. For a whole host of soundness reasons, dry E6016 electrodes, manipulated properly, yield the soundest weld metal and joints.

Some conditions leading to bead



TAKES SHOCKS: For low temperature impact strength requirements, the lime base low hydrogen classes like E6016 and E60LI are widely useful.

There are probably more weld joints in service today using E6012 weld metal than all other types combined.

or underbead cracking extract a slight rating penalty from the E6027 and E6020 types. The other groups have been penalized because of microfissures, porosity or cracking. Yet, even the low rating given the E6012 classification does not imply any hazard in using this product. There are probably more weld joints in service today using E6012 weld metal than all other types combined.

Metal Must Flow—Ductility is generally measured by the elongation in 2 in. of a 0.505-in. diam tensile bar machined from an all-weld-metal specimen made under precisely controlled conditions. The rating numbers reflect these test results and more. For ductility is also the ability of weld metal to flow plastically under conditions of the restraint and shrinkage normally encountered in welded fabrication. The ratings have been influenced more by tensile ductility than by good behavior in welded joints.

Construction, mining and transportation equipment operates at low temperatures and is expected to withstand severe shocks. Under such conditions, the low temperature impact strengths assume tremendous design importance. The lime-base low-hydrogen classes E6016 and E6011 lead the parade. From actual Charpy V-notch figures, many welding engineers would show a bigger rating drop between the first and second groups.

Others argue that as long as both exceed 15 ft lb at -40°F , what difference does it make if the first group registers 40 ft lb and the second group registers 20 ft lb. Most chief engineers who know the cost of field failures will vote for all the impact strength that can be built into the equipment for such service.

Save on Cleaning—Spatter, too, is a cost-provoking part of manual metallic arc welding. Only these electrode groups rated 6 or lower produce significant amounts of spatter. Protecting the surfaces of the plates adjacent to the joint itself with so-called spatter-proof compounds (actually preparations that prevent the spatter from welding to the base metal) will simplify post-weld cleaning.

Sometimes, welding joints are as ill-fitting. No one suggests that the bridging of poor fit-up gaps is either desirable from a quality or cost viewpoint. But there are times when poor fit-up must be converted into a welded assembly. The quick solidifying weld metal from E6012 electrodes works best. Six other electrode classifications work with varying degrees of success as pointed out by the rating factors.

Some Weld Easily—Welder appeal cannot be assessed with mathematical precision. Experience suggests that the ratings in Table II are substantially correct. Types E6024 and E6027 will almost weld by themselves if the heavy coating is rested on the joint path. Among the "free-arc" classes, both the E6013 and E6020 are characterized by extremely stable arcs and good slag control.

Slag removal can be evaluated among classifications in terms of ease of removal. The table does just this. A word of caution to the inexperienced may be in order. There are differences between brands in the same classifications as there are differences in ease of slag removal based upon joints.

The light slag from E6010 electrodes may be removed from the joint by raking the slag with the bare end of an electrode. For some reason, E6011 slag is a bit more difficult to free.

Slag Lifts Off—Many brands of E6013 electrodes are self-cleaning when applied as a horizontal fillet weld. The cooling slag curls away from the weld bead and may fall free by itself. But in a groove, slag removal is another and more difficult matter. As a general rule, slag removal from narrow grooves is the most difficult. The cooler the slag, the easier the removal.

A special case is coated steels such as galvanized steel. Here the two digging arc electrodes, E6010 and E6011, work well.

Since the proof of the pudding is in the eating, does this system work? Suppose a pipeline contractor is building a cross-country line with $\frac{3}{8}$ in. thick pipe and his new welding engineer wants to choose the best electrode type. They have direct current equipment only, must make completely penetrated welds from one side only and encounter all positions of welding. What factors are involved in selecting the best electrode? Table III shows the rating selection.

Three Restricted — Note that three types of electrodes, E6020, E6024 and E6027, were not scored because they cannot be used in all positions. E6010 and E6011 tied for first place. E6010 electrodes have been used for this work and E6011 are too new to know if they will be widely adopted by pipeline crews.

Suppose a power shovel maker is using horizontal and downhand fillet welds for his products. Heavy steel, restrained joints, and good impact strength at low temperatures are all part of his needs. Table IV shows this solution. It seems as though E6016, E6011, E6020 or E6027 would be satisfactory. Historically, E6020 electrodes were used until the E6016's showed better field stamina.

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How Long, How Fast To Heat Tool Steel

PART 1

Do you know how furnace temperature affects the heating rate of the tool steels you harden and temper? Or the effect a machined surface has on heating time?

These questions aren't academic. Correct answers help simplify and improve your heat treat practice, speed your operations.

Most heat-treaters know how hot to heat a given piece of tool steel. Seldom are they told how fast or how long to heat it. As a rule, they are instructed simply to heat slowly and uniformly to a specific temperature. Here are practical pointers provided by Carpenter Steel Co.'s metallurgical research laboratory.

To make the right decisions on the time for heating, the hardener should know exactly how tool steel heats. For example, it is common belief that the surface of a tool reaches the furnace temperature before the inside comes fully up to heat.

Dead Center—If this is true, the hardener must know how long it takes for the center to catch up in all different sizes and at all temperatures. Only with this knowledge can he decide how long to soak the tool after it looks right on the surface.

If the belief about cold centers is not true—as is the actual case—he wants to know it so that he may not needlessly soak the piece for a long time, to its possible detriment.

Extensive tests with a wide range of Carpenter tool steels point to certain basic facts that can be applied in determining the proper time for heating a variety of tool steels.

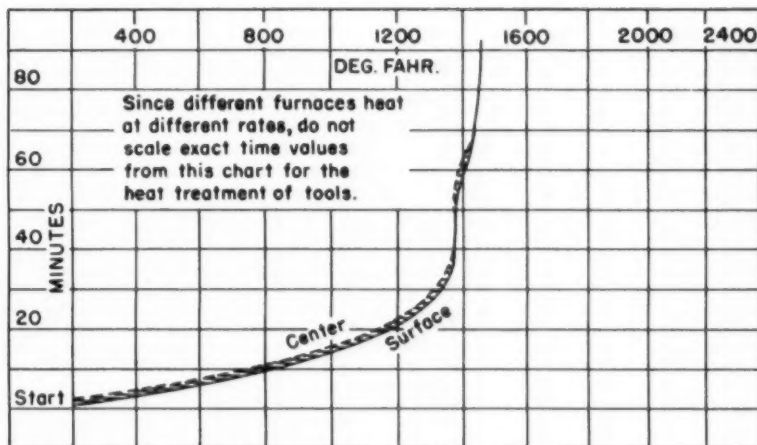


Fig. 1—Heating curve for a piece of water hardening steel 3 in. round by 6 in. long. Electric muffle furnace is held at 1450°F.

Application of these fundamentals should simplify heat-treatment and improve tooling.

Basic Pointers—We can get a good picture of how tool steel heats by heating a piece of water hardening steel (3 in. diam by 6 in. long) in an electric muffle furnace to 1450°F. The surface absorbs heat from the furnace gases until it reaches the same temperature as these gases. Then it stops.

The center of the piece gets heat in one way only—by conduction from the surface. So long as the center is colder than the surface, it continues to draw heat from the surface. Thus it cools the surface while heating the interior.

What are the characteristics of this surface? It has no thickness, or it wouldn't be a surface. It has no weight, no mass—and hence no capacity to store heat.

Surface Action—All a surface does is absorb heat from the furnace

atmosphere on one side, and give it up to the interior metal on the other. Therefore it would be impossible for the surface to be as hot as the furnace and still have a cold interior.

The only way the surface can reach furnace temperature is for the center to stop cooling it from below. This happens only when the entire piece is uniformly heated. That is why the center and surface must arrive at the furnace temperature together.

To find out exactly how that 3-in. round heats, we hook up thermocouples to the surface and center of the piece, put it into the same furnace and hold the temperature constant at 1450°F.

Critical Temperature—Notice from the chart in Fig. 1 that the steel heats rapidly at first when the temperature pull is greatest, but very slowly as it approaches the furnace temperature. The flat spots at about 1350°F mark the critical tempera-

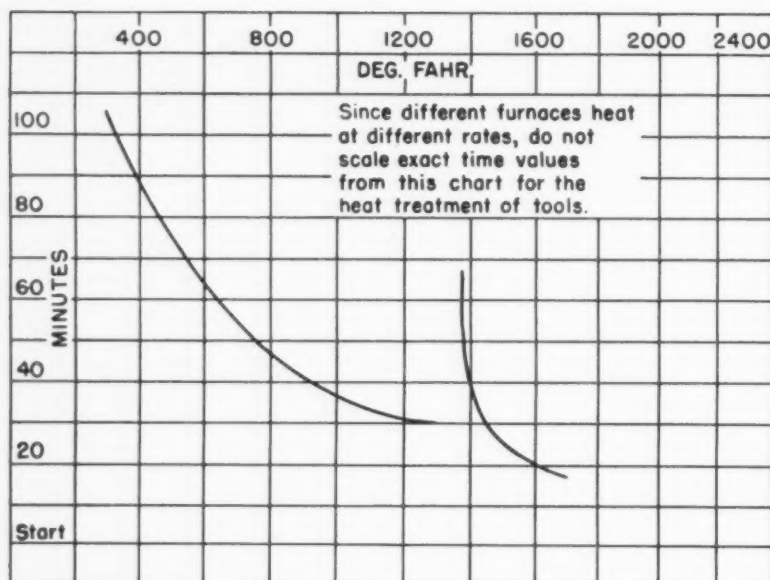


Fig. 2—Curve shows the effect of initial furnace temperature on heating time. The hotter the furnace, the shorter heating time.

ture range of the steel. When this range is reached, the steel stops heating until it has soaked up enough heat to complete the critical transformation.

In Fig. 1, the solid curve follows the heating of the surface. The dotted curve follows the center of the piece. At first glance, they seem very close. But on more careful examination, it can be seen that the actual difference in temperature between center and surface is represented by the length of the horizontal lines that connect the two curves.

TABLE 1.
EFFECT OF FURNACE TEMPERATURE ON HEATING TIME

Furnace Temperature	Heating Time
300 F	107 mins.
500°	77
650°	60
800°	48
950°	39
1100°	34
1275°	31
1340°	30
1375°	67
1400°	40
1425°	34
1450°	32
1525°	25
1600°	21
1700°	17

Curves Converge—Even at that, the difference in temperature is only about 100°F during the early stages of heating. It is much less as the steel approaches the critical range. Significantly, the curves run together during the last 25-30°F of heating. This is true of all sizes tested and holds good at all temperatures—proving that when the surface is up to heat, center is up also.

Since there is no large difference between the center and surface temperatures during heating, there is no danger of destructive strains except in the case of badly balanced sections. It is generally safe, when hardening through temperatures of 1450-1650°F, to put tools made from modern steels right into the hot furnace and allow them to come up to temperature as fast as the steel will absorb the heat.

Comparing Color—Knowing that the center of the tool comes up to heat with the surface, we can make sure the entire tool is at temperature by checking the surface heat. The best way to do this is to compare the color of the surface with that of the thermocouple in the furnace. Carpenter's laboratory experience shows that the normal eye will find the colors alike when the thermocouple at-

tached to the surface is about 5°F colder than the furnace. You can't see those last few degrees.

Other Factors—By timing various sizes for a temperature of 1450°F, we found that it takes about five minutes per inch of thickness for the steel to cover those last few degrees. At lower temperatures it would take longer, and at higher temperatures it would take less time.

Exact heating rates will vary depending upon the capacity of the furnace. Of course, there are many other things that influence the speed of heating besides the size of the piece and capacity of the furnace.

One factor that greatly affects the heating rate of tool steels is the initial furnace temperature. Certain conclusions can be arrived at by testing like pieces of water hardening steel 1½ in. diam by 3 in. long with a thermocouple in the center. These samples are placed, one at a time, in an electric furnace preheated to various temperatures.

Pyro Checks—A pyrometer gives us the data (shown in Table 1) on the relationship between furnace temperature and heating time. Fig. 2 charts the total time needed to heat the sample pieces of steel to the various temperatures in the test. Except in the critical temperature range around 1350°F, the hotter the furnace, the shorter the total heating time required.

The hardener should understand the significance of the critical zone as it affects heat-treating procedure. If he hardens a tool steel from a temperature in the critical range, the process will take many times longer than that obtainable with a hotter furnace. He may also run into other complications. Knowing the steel's critical, he should avoid quenching from this temperature.

Effect of Surface—In low temperature heating, the surface condition of a tool has little effect on the heating rate if the heat is applied by means of an oil bath, a salt bath, or a hot-air furnace with forced circulation. But the surface can make a big difference in a still hot-air furnace where most of the heat is trans-

mitted to the piece by radiation. Under these conditions, radiant energy is reflected by a bright surface and absorbed by a dark surface.

Fig. 3 plots the results of heating two water hardening specimens to 500°F in an electric tempering oven without forced circulation. One specimen has a dark, scaled finish; the other a bright, smooth machined finish.

Reflected Heat—The scaled piece reached temperature in about 70

minutes. The machined piece required about 100 minutes. If the machined piece were polished to an even finer finish, it would take over two hours to reach temperature.

Obviously, it takes about twice as long for a highly polished surface to heat under these conditions as for a piece with a dark or scaled surface. This is not too significant only because a high percentage of all low temperature drawing is done on tools that are discolored from hardening. Tools in this condition will

absorb radiant heat at the fast rate. Conversely, tools that are bright hardened will require considerably longer time in the draw.

In high temperature heating, the steel scales when heated in an oxidizing atmosphere. So regardless of whether it starts out bright or dark, it will become dark when it reaches the "slow" part of the heating cycle (Fig. 3). Thus the original finish has little effect on the heating time required for high temperature hardening.

To check this theory, a test was run on water-hardening steel. The bright machined piece was slower than the dark piece in getting started, but after it acquired a tarnish it quickly caught up.

Other effects of surface condition on heating time are shown in Table 2.

This table of representative values cannot be transferred bodily to your own hardening practice because of possible differences in furnace conditions. But the same ratios can be expected in any furnace.

Type of surface	Total time to heat to 800°F (still atmosphere)	Total time to heat to 1450°F (controlled atmosphere)
Highly polished	80 mins.	38 mins.
Ground, No. 36 emery	60	36
Finish machined	60	36
Rough machined	65	36
Threaded	65	36
Sandblasted	55	36
Pickled in 1:1 muriatic acid	45	34
Temper tarnished at 800°F	45	36
Scaled at 1400°F	50	34

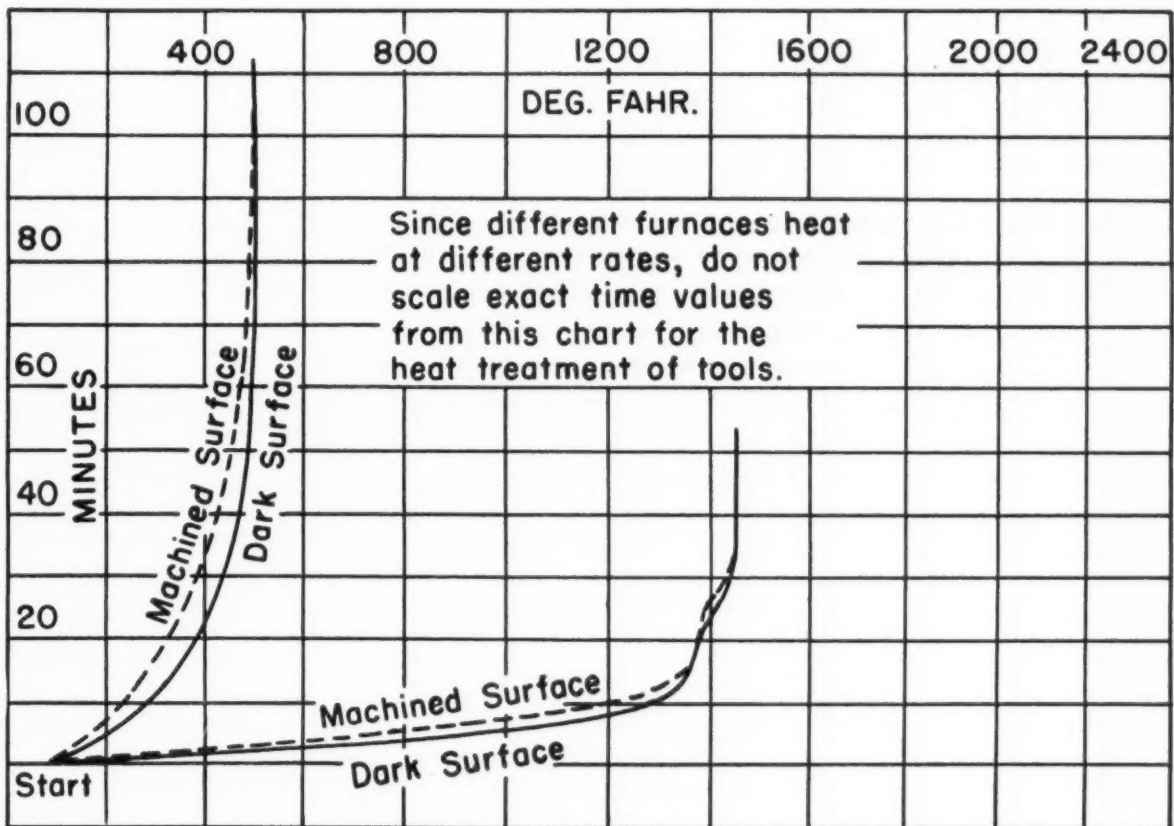


Fig. 3—Curve shows effect of surface brightness on heating time. Brightness slows heating rate.



EASY REFERENCE: This board records the necessary data and expedites job sequence for milling machines.

Smooth Production Flow With Flip-Card Records

Effective record-keeping systems are a must for management to keep a firm hand on the reins.

The best systems are geared to the particular plant's needs. They help "free up" production flow; are themselves unobtrusive.

This system proved clean, fast and simple in a complex area of one firm's operations.

■ Efficient record-keeping systems are vital to modern metal working operations, where high production, specialization and interdependence are the order of the day, and where a production part gone astray can make looking for a needle in a haystack seem like child's play.

A new record-keeping system is helping Boeing Airplane Co. keep a firm hand on the production reins in one complex area of operations at their Wichita, Kan., plant. The method saves time for inspectors, supervisors and upper-echelon management.

By going over to the improved system, the company reports it's saving almost \$300,000 a year on clerical costs alone.

Complex Problems — Boeing is producing two key units in America's combined offensive - defensive program, the B-47 Stratojet and the huge B-52 Stratofortress. Production requirements are complex and extremely detailed, and call for an equally effective administrative system to keep operations from bogging down in confusion. A look at

Wichita's Unit Time Assembly Area gives an idea of the scope of the paperwork problem.

These Unit Time Assembly Areas (the term "Unit Time" means that costs are compiled on a single unit, and not multiples of lots) are broken down into smaller production areas, according to major assembly sectional units. Each area is responsible for assembling a portion of the aircraft being built.

Further Subdivided — Production areas, in turn, are broken down. Each may have from 5 to 30 or more positions, each doing repetitive work which then passes on to the next position. Within these positions, labor crews may be broken down into units.

Snags are costly in this setup. Work flowing into and out of each



QUICK TIP-OFF: Important control data is readily available on office end.

position has to be completed and inspected in the allotted time. If it isn't, incompleting work goes on to subsequent stations, and costly work-chasing and follow-ups become necessary.

Boeing's previous method of record-keeping failed to provide the strict controls needed to avoid such mishaps. Management has to know what is going on at each position as work moves, and the old system gave them no easy way of getting this information. Results were a lack of efficiency, wasted production effort and inordinately high clerical costs.

More Readable — The company now uses Remington Rand's visible Kardex system. This gives the control data needed as it is needed. The crew loading factors at each work position are controlled by bar chart distribution.

The Kardex visible principle is a simple one. It involves the use of overlapping pockets on which the bottom edges are visible. Kardex cards go into these pockets, with identifying information showing through in the visible edges, where a complete signalling system can be used to highlight specific situations.

Complete Data — Each Kardex pocket holds a job card. This lists parts needed for the job, job description and any necessary footnotes, and reference inspection requirements, together with any other pertinent information. Job cards for each labor crew are arranged in sequence of operations on the Kardex panels. Number of panels at any one position depends on the number of operations.

In Boeing's system, the panels don't move along down the assembly line with the units. They stay at the one position, and are used over and over again for other units flowing by.

The only change is in the label which identifies the particular unit on which work is being done.

Accommodates Changes — When engineering changes are made, new job cards reflecting these changes are put in the panels. If the work at a given position hasn't been finished, but the section is moved on, a Kardex traveler panel containing only the job cards for the unfinished work goes along with the section until the unfinished work is completed.

The Kardex panel at each position serves two main purposes:

First, it gives a visible work load accountability to the men working there. And second, it provides quick, visual accountability on all jobs from the time work is started through to completion. It also serves to control parts received from the Parts Control Area servicing the position, and is valuable in verifying job description and sequence of operations.

Speeds Inspection — Inspectors are happy with the equipment, which has proved to be a substantial time-saver for them. Before, they had to leaf through numbers of looseleaf binders to check on the status of the work. Now the status of all operations is highlighted by signals in the visible edge of each Kardex pocket, immediately calling the inspector's attention to completed operations.

Thus each inspector devotes his time only to the records and work which concern him.

Crew supervisors in each position are also helped. By checking the Kardex records, each supervisor can make sure the work is moving along according to schedule, in the proper sequence. Any hitches are quickly spotted, and corrective action can be taken.

Finally, the system provides a quick, accurate control that can be spot-checked easily by management to be sure work at each position is progressing in line with overall production schedules.

Savings Incidental — Taken together, these advantages have added up to the large monetary savings already mentioned. But more important to Boeing is the tight degree of management control they feel they've achieved. The drastic reduction of time lost due to poor accountability, time lost by inspectors through having to use inadequate records, and waste due to inefficiency—these were Boeing's main objectives.

Having attained them, dollar savings followed along with them as a matter of course.

New Process Puts Higher Profit In Low Grade Ores

Steelmakers watch Far Eastern clashes closely. One reason is ferromanganese, most important of the ferroalloys in steel-making.

Its ores come mostly from India and Africa, subject to the political vagaries of our time.

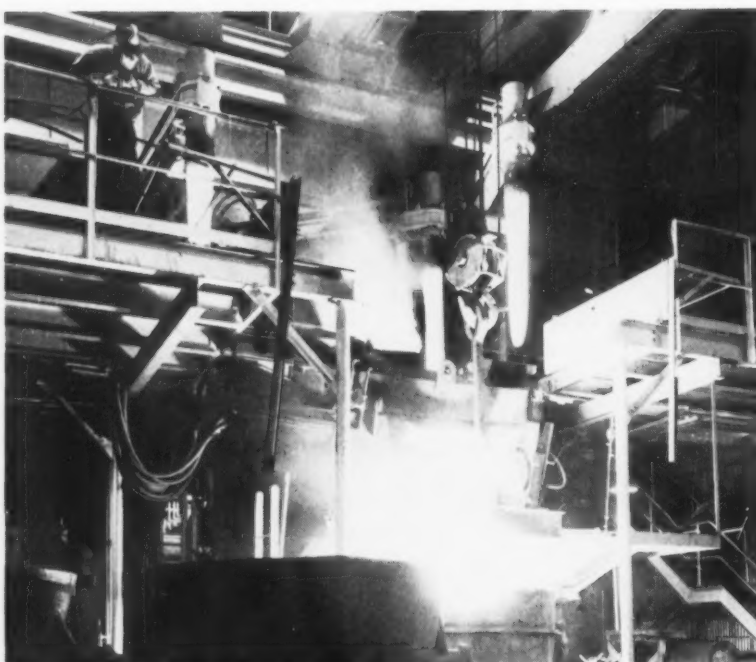
Nearby ores exist, until now unprofitable to work. A new recovery process can change this, upgrade many deposits.

■ Metallurgists continually search for low-cost ways to process the more readily-available, widely distributed, low-grade ores. Up to the present, success has been spotty. Most of the many techniques suffer from high recovery cost.

Now a new smelting process attacks the problem of recovery cost on a broad front. Yields run up to 95 pct from ores that many call commercially worthless.

Developed to extract ferromanganese from low-grade ore, the process also shows great promise in other areas.

Wide Use—These include, (1) recovery of iron, alumina and titania from high-ferrous bauxite; (2) recovery of chromium and iron from low chrome-ferrous chromite; (3) recovery of titania and iron from titaniferrous iron ores, such as ilmenite; (4) recovery of iron and alumina from the red mud residues of the Bayer alumina process for purifying bauxite. These residues are often dumped now. And (5) recovery of iron from low grade



UNUSUAL FURNACE PRACTICE: Operation at a power factor near 95 pct results both from unusual furnace design and practice. Electrodes barely touch the slag surface. Coke and lime charged are kept away from electrode.

Canadian iron ores assaying at 18-22 pct Fe.

Each of these five has successfully passed pilot testing.

All these processes, and others like them, have one thing in common. You want to remove iron, either to (1) recover it, or (2) purify the material of iron contamination, and so simplify later smelting operations. In these areas, the developers stake their claims.

Consider ferromanganese production. For this alone, the process holds broad significance.

Ferromanganese is rightly called the most important of the ferroalloys in steelmaking. It's used not only to purify and deoxidize steel,

but also to add manganese to iron and steel alloys.

About 4 lb of manganese goes into the average ton of steel. Some steels, such as Hatfield manganese grades, call for up to 340 lb Mn per ton of steel. This to achieve a final 13 pct manganese content.

Some Still Doubt—Proponents of the new process claim it will convert low-grade ore into ferromanganese at costs no greater than those of producers working with high-grade manganese ore. This is a startling claim that some still shake their heads over.

From a 12 pct manganese ore comes ferromanganese competing in

price with that derived from 48 pct manganese ore. Dr. M. C. Udy, the developer, says his firm is doing this without even taking \$70 per ton credit for the ingot iron by-product. (About one ton of iron is produced for each ton of ferromanganese.)

Backing up his judgment is a \$2 million prototype ferromanganese plant opened in January at Niagara Falls, Ont. Its 50-ton daily throughput yields 7 tons ferromanganese and 7 tons pig iron. The Canadian plant is run by Strategic-Udy Metallurgical and Chemical Processes, Ltd., a subsidiary of Strategic Materials Corp., both of Niagara Falls, N. Y.

Economics of present smelting methods call for using high-grade manganese ore. Imported mostly from South Africa and India, its manganese content runs up to 50 pct.

Use Poor Ore—Strategic-Udy reports yields of 95 pct from ores assaying at 11 pct manganese, 18 pct iron and 1.5 pct phosphorous. Enormous quantities of such ores, called commercially worthless by many, exist in the United States and Canada. There's a 1.5 to 2-million ton proven low-grade deposit near Woodstock, N. B.

Costwise, savings shape up something like this. It now takes two tons of high-grade ore to produce

one ton of ferromanganese by standard refining methods. Each ton of high-grade ore costs the producer \$60, or thereabouts.

The Strategic-Udy process requires six tons of ore per ton of ferromanganese. But the raw ore costs only \$4 a ton, delivered at the plant. So figure a raw material saving of \$96 per ton of smelted ferromanganese.

To Cost Less—Ferromanganese in early 1957 cost near \$255 per ton for the standard alloy, containing 74-76 pct manganese. The savings possible are easy to calculate. Whether these savings will materialize depends on operating costs now being derived at the Niagara Falls prototype plant.

Results to date are most encouraging, says Dr. Udy. For example, he estimated each ton of ferromanganese would consume 7000 kwh. Actual power use is running substantially less. Just why this is still isn't clear. The chemical reaction in reducing ore to ferromanganese seems exothermic.

Strategic-Udy considers the cost data so pleasing that it's already arranging financial backing for its \$15 million, full-scale production plant. Construction on it will start, the firm forecasts, by mid-1957 at Woodstock, N. B. With this starting date, expect full operation by mid-1958. Planned output is 75,000 tons of ferromanganese per year.

Smelted Twice—Selective reduction is the key to economy in the new process. Ore heats to 2460°F (1350°C) in the first stage electric furnace. Both iron and phosphorous content settle, and are tapped off.

Slag floating on the molten iron retains its manganese content. It's moved to one of three second-stage electric furnaces. All three furnaces produce ferromanganese, but to different specifications.

High - carbon ferromanganese comes out of one furnace. Carbon is the reducing agent.

Three Steps Here—Medium-carbon ferromanganese calls for three smelting stages. After the iron-

phosphorous dropout, molten slag moves into a second-stage furnace. There quartzite and coke are added. The silicon and carbon reduce the high-manganese slag to ferro-manganese-silicon. Silicon content at this point runs 16-18 pct.

In a third-stage furnace, this silicon reduces still more slag to medium-carbon ferromanganese.

Low-carbon ferromanganese results from adding quartzite to slag in the second-stage furnace. Reducing action of the silicon converts slag into ferro - manganese - silicon that contains about 40 pct Si.

A third-stage furnace again reacts silicon with more slag. The end result is low-carbon ferromanganese.

In operation, the prototype plant works continuously, as will the production plant.

Ore comes into the plant by conveyor. It moves first through a crusher, then into a rotary kiln. This last heats the ground ore to 1650°-2200°F (900°-1200°C), and drives off oxygen, water and some carbon dioxide.

How Controlled — At the same time, kiln heat reduces iron oxides to stable ferrous oxide (FeO). Tests determine how this reaction takes place, and how much reducing agent will be needed later. Weight loss in the kiln runs about 13 pct.

Sintered ore drops into insulated ladle cars, and feeds to a reverberatory furnace. The oil-fired furnace acts only to bring the ore to its melting point, about 2460°F (1350°C).

From the reverberatory furnace, the molten mix moves in refractory-lined, insulated cars to the first-stage electric furnace. There coke is added to reduce the iron. Reduction proceeds rapidly. Iron settles quickly to the furnace bottom. With the iron goes the ore's phosphorous content.

Phosphorous can be separated from the iron in a separate electric furnace to yield a marketable pig iron.

The furnace combines arc and resistance heating. Its electrodes barely touch the slag.

Where Ferromanganese And High Manganese Ores Went in 1955

	Short tons
Alloys and metal	1,815,115
Pig Iron	26,257
High-carbon ferromanganese	767,400
Medium- and low-carbon ferromanganese	74,100

Source: Bureau of Mines

Dextrose Binder Speeds Core Production

By C. F. Lourich—Technical Representative, Corn Products Sales Co., New York

Foundrymen expect core binders to meet certain basic performance requirements.

Beyond this, if a particular binder promises to speed production or cut costs, it's apt to get an attentive ear.

Check this new dextrose binder's performance against your foundry needs.

■ Replacing conventional core oils with a dry form of binder derived principally from corn sugar is speeding up core production in several eastern and midwestern foundries.

Cores made with the dextrose binder are reported to bake through in 40 to 50 pct less time than cores made with conventional core oils. And cores bake harder and stand up better when the hot metal hits them. There is no metal penetration.

Case In Point—The experience of Tower Grove Foundry, a division of LaClede Stoker Co., St. Louis, Mo., is typical.

Tower Grove was using "fast drying" core oils in their sand mixes 10 months ago, when Corn Products Sales Co.'s new dextrose binder, Dexocor, was brought to their attention. They frankly felt their core oils were giving them the fastest drying time possible, but agreed to try the dextrose binder on small cores.

Trial bakes quickly demonstrated that cores made with Dexocor baked through in 40 to 50 pct less



STRIP EASILY: Excellent flowability of dextrose mix give uniform structure throughout cores. Draws are made easily without sticking.

time than cores made with the "fast-drying" oils.

Tower Grove started putting Dexocor into sand mixtures for all its small and medium size cores; plans to use it in large cores too as soon as a new, large gas-fired oven is installed.

What It Is—This relatively new baked strength binder is a white, water-soluble powder. Principal

ingredient is dextrose, a refined corn sugar. To this is added a small amount of catalyst which, in the presence of heat, converts the corn sugar into a superior bonding material for the sand.

The dextrose binder is added to the sand mixes with standard cereal binder and water. The resulting mixture permits blowing or ramming of cores by usual methods.

Tower Grove uses local Missouri sands and Ottawa sands, mixed with the cereal binder and Dexocor in a conventional muller. Mulling time for the Dexocor sands is slightly shorter than for oil sands, since only one liquid (water) is added to the dry mix.

Stiff at First — First mixtures made at Tower Grove with the new binder were somewhat too stiff. The core room foreman soon put his finger on the trouble. Much smaller amounts of cereal binder are required with Dexocor than with core oils. So the cereal binder content of the mix was progressively cut to half the usual amount.

Sand mixes at this foundry have good flowability and are well suited to both blowing and ramming of cores. The cores draw or strip easily from the boxes without sticking.

Stand Up Well—Despite excellent workability, of the sands, green cores made with the binder are unusually resistant to sagging. Some of the cores are quite bulky. But even those with high stands or overhangs hold their shape perfectly during their trip from core box to oven.

Cores are baked in gas ovens at 375°F. The 40 to 50 pct reduction in baking time saves fuel. But even more important, it gets the cores in and out of the ovens quickly and permits more flexible scheduling of production in the foundry.

During baking, water evaporates and joint action of heat and catalyst transforms the dextrose into a resin-like substance for uniform bonding of the sands. Tower Grove reports that cracking of cores made with the Dexocor sands is practically unknown and metal penetration offers no problem.

Quality's Improved — Cores made with the material also liberate less gas and smoke. Avoidance of gas defects and freedom from veining have made positive contributions to casting quality. Tower Grove feels.



NO PROBLEM: Veining like that in casting no longer troubles Tower Grove Foundry since they made the change to the dextrose binder material.

Another foundry, the Brillion Iron Works at Brillion, Wisconsin, reports the new binder proved particularly helpful in cores for engine manifold castings. The Dexocor sands blow more smoothly, with more uniform density throughout the core box.

Veining on the interiors of the manifold castings has all but disappeared, since they began using Dexocor some 18 months ago, and with it the necessary machine work and grinding to finish castings.

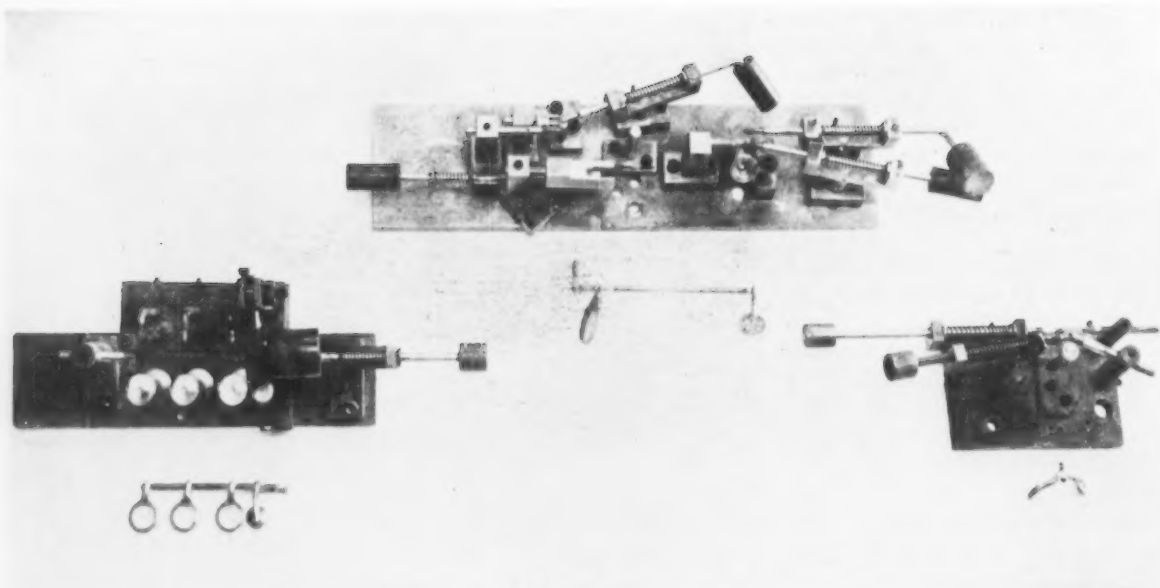
Bake Harder — The company also finds that cores made from the corn sugar binder bake to a superior hardness and stand up better when

the hot metal hits them. There is no metal penetration.

Brillion's core room foreman, reports baking time's reduced 50 pct, compared with oil sand cores. Manifold cores weighing five to ten pounds bake through in an hour and fifteen minutes. Fifty pound cores will cure in an hour and 45 minutes.

The same foundry reports the dextrose binder substantially reduces gas evolution; there is noticeably less smoke in the foundry.

Brillion says the Dexocor cores exhibit improved collapsibility despite the high baked strength and shake out faster and easier than cores from oil sands.



CARBIDE TIPS: Holding and positioning points of these three jig assemblies have cemented carbide tips.

Carbide Jigs Resist Solder

When you silver-solder small parts, how do you keep from soldering them to the jig?

One small firm solves this by using jigs equipped with cemented carbide components.

▪ Cemented carbide jig components help a small manufacturer maintain accuracy in soldering operations. The firm, a band instrument maker, joins its assemblies by silver-soldering.

After switching from another material, H. A. Selmer Inc. of Elkhart, Ind., now uses cemented carbide positioning and holding points on its jigs. The firm finds these have excellent wear resistance at the 1500° to 1600°F joining temperatures. They also resist deterioration at this heat. The elements withstand wear induced by the oxidizing action of an oxygen and manufactured gas flame.

No More Filing—The material's non-sticking action also contributes

to accuracy. Once cemented carbide gets a thin tight layer of oxide, silver-solder—and the nickel-silver components themselves—do not stick to the carbide. As a result accidentally stuck-together items need not be filed apart. The jigs thus remain intact. Continuous filing, of course, impairs accuracy and puts the jigs out for repairs all-too-often.

In silver-soldering key assemblies for flutes and clarinets, the company makes use of hundreds of different sets of jigs for locating and holding tiny parts. Depending on the assembly involved, the jigs handle from three to seven shapes while the operator manipulates the gas torch and wire solder.

Most jigs consist of a visual guide bar and positioning and holding pins. The pins, in some cases, are fixed for positioning. In others, they are on the ends of rods which are adjusted to position and hold the parts while the operator applies the 45-pct silver alloy solder and flame. The visual guide helps the

operator keep the parts correctly aligned.

A typical soldering setup involves five different key components: a small piece of wrought tubing, two nickel-silver castings, a pad cup of sheet metal and an adjusting lug. The jig assembly acts as a foundation for these during soldering.

Unsatisfactory Condition—Although the previous material used was the best then available, soldering conditions were far from ideal. There were too many instances of keys being soldered to the jigs. Each time this happened, filing would be necessary. This meant that some of the components, as well as important jig elements, would also be filed away.

Today, using a Carboloy cemented carbide supplied by General Electric Co.'s Metallurgical Products Dept., soldering operations are greatly simplified. Filing is no longer an operation chore. The jigs now stay intact to offer the accuracies needed in assembling the instrument key components.

24

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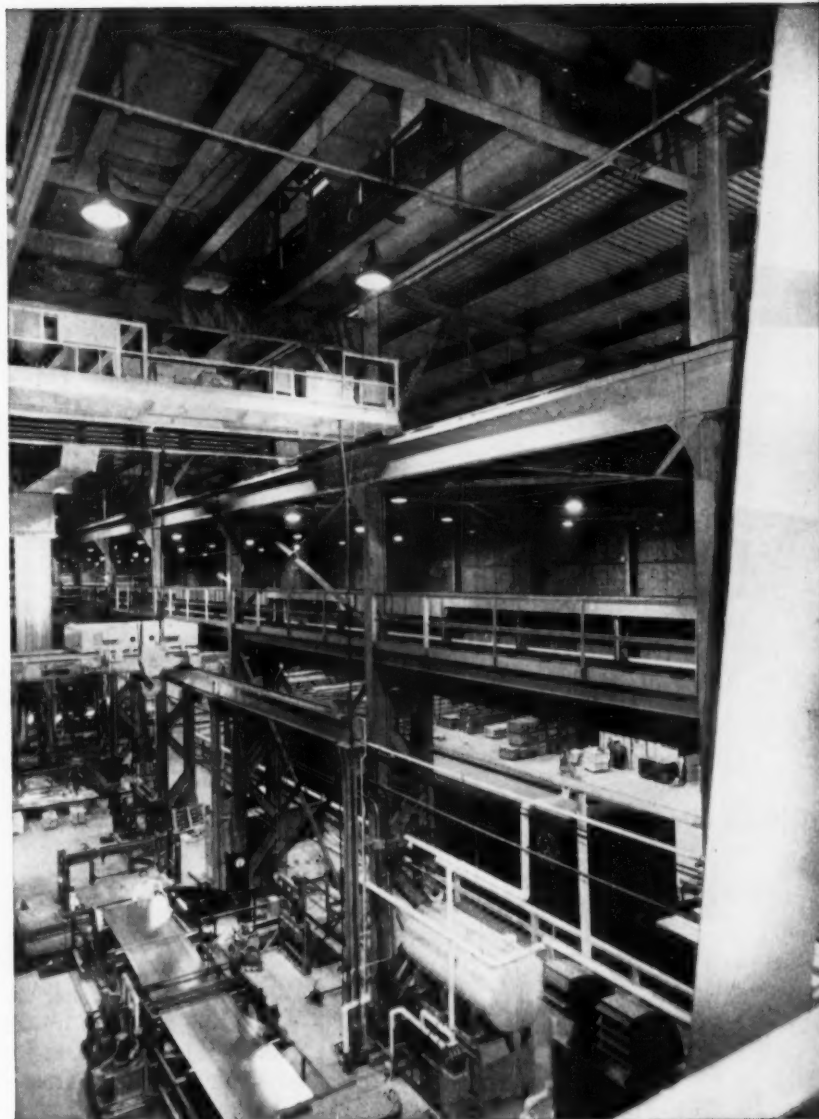
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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 114.

Air Control Valves

Pilot operated poppet-type air control valves are listed in a 16-page catalog. (Galland-Henning Nopak Div.).

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Indexing Unit

Literature covers the assembly of a 65-in. horizontal indexing machine from standard machine components. (The Hartford Special Machinery Co.).

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Magnetic Drives

Magnetic drives are shown in a 6-page foldout brochure. It contains data on design, drive features, operating and performance curves, output torque rating-dimensions, selection chart, and photographs of installations and applications. (Whitney Chain Co.).

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Redraw Presses

Horizontal, multi-station, automatic redraw presses appear in a dozen-page brochure. These redraw presses perform quantity production of straight and shouldered, deep shells in a wide variety of sizes and shapes. Detailed information covers 13 machines with 5 to 12 stations having blank length

maximums ranging up to 9-in.; production rates to 100 shells per minute. (Waterbury Farrel Foundry & Machine Co.).

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Bearing Metal

Babbitt metals made by the Glyco process, says a brochure, are superior to tin alloys, cost less, and last longer. The bulletin states other advantages: fine grain structure for reduced friction, great strength at high operating temperatures, free flowing, unharmed by overheating, free from dross, reusable. (Joseph T. Ryerson & Son, Inc.).

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Pumps, Motors

Rotary pumps and hydraulic pump-motors are described in a 12-page catalog. Another booklet, of 36 pages, tells how to solve various pumping problems. (George D. Roper Corp.)

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Drill Presses

Drill presses are illustrated and described in a dozen-page publication. Specifications are given for floor and bench, single and multiple spindle models in several basic sizes. (Delta Power Tool Div., Rockwell Mfg. Co.).

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Steel Products

Containing 232-pages, a product and warehouse catalog describes over 700 products available from stock at one company's warehouses located throughout the country. The

book index lists 16 categories of special purpose steels, including high speed, tool, stainless, alloy and machinery, available in 16,000 grades and sizes. (For free copy, write on company letterhead to Engineering Service Department, Crucible Steel Co., Box 1558, Pittsburgh 30).

Burner Shut-off

Complete with scale drawings, sizes, and specifications, a 4-page booklet emphasizes how a burner shut-off valve reduces stove-changing time, prevents gas leakage, provides tight, sure closure, and reduces maintenance. (Koppers Co., Inc.).

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Clamp

A strong, deep clamp is described in a 4-page folder. The clamp has a forged steel heat-treated frame and a large diameter full length screw with a forged wing. It comes in four stock sizes. (The Cincinnati Tool Co.).

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Barrel Repair

Low cost repair kits for Plexiglass and Lucite plating barrels are detailed in a technical bulletin. (Frederic B. Stevens, Inc.)

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Sealers

Sealers specifically designed for sealing curtain wall structures are introduced in a 4-page folder. (Minnesota Mining & Mfg. Co.).

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Impulse Counting

Predetermined electric impulse counters and impulse transmitters are covered by an 8-page catalog. (Landis & Gyr, Inc.).

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Coil Feeding

Pressroom equipment is shown in a 12-page catalog. It covers data on steel coils and other alloy stock. In addition, it offers details on hy-

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draulic punch press feeds, combination cradle and straighteners and loading ramps. (Special Engineering Service, Inc.)

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Hermetic Motors

Ten pages illustrate high-steel production facilities, quality control, and research are used in manufacturing hermetic motors for the refrigeration and air conditioning industry. (General Electric Co.).

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Gear Honing

Economics of gear honing are discussed in a 4-page bulletin. (National Broach & Machine Co.).

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Electric Furnaces

Box-type electric furnaces are covered in a 12-page bulletin. It discusses electric units for tool room applications. (Westinghouse Electric Corp.).

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Brazing Alloys

High temperature brazing alloys and related materials of stainless steels and special alloys are covered in a 4-page brochure. (Stainless Processing Div., Wall Colmonoy Corp.).

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Ballbearings

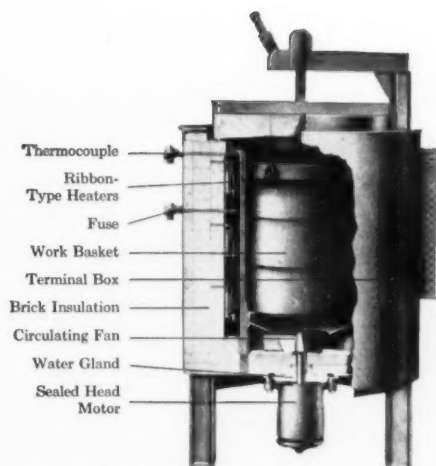
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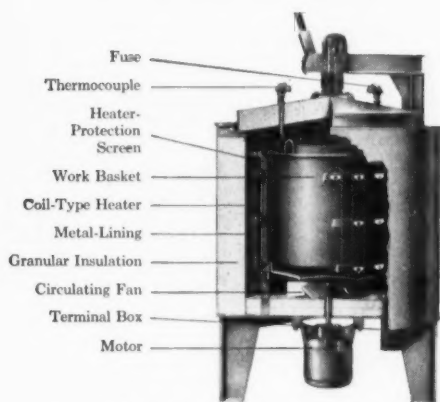
Analysis

Illustrated and informative, a 28-page brochure describes basic fundamentals of spectrochemical analysis. (Jarrell-Ash Co.).

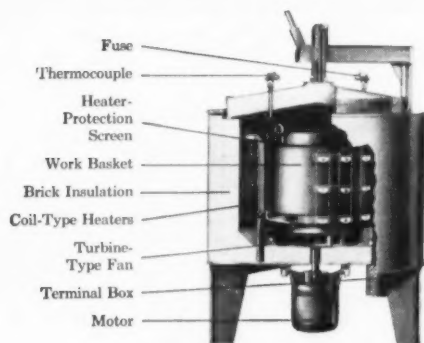
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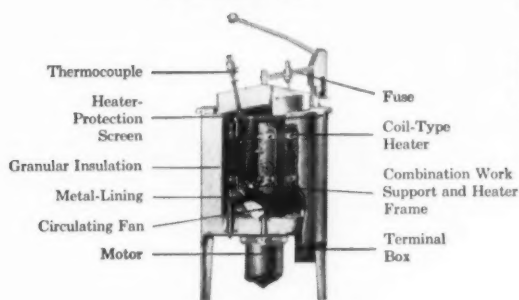
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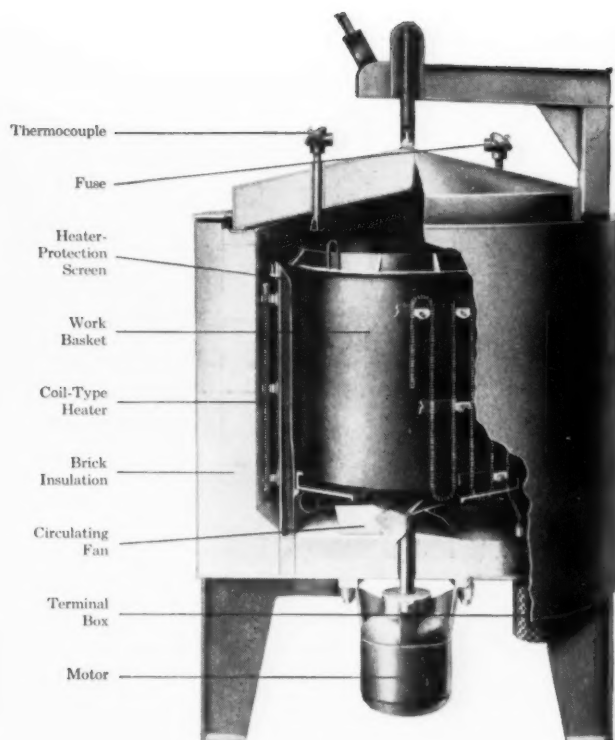
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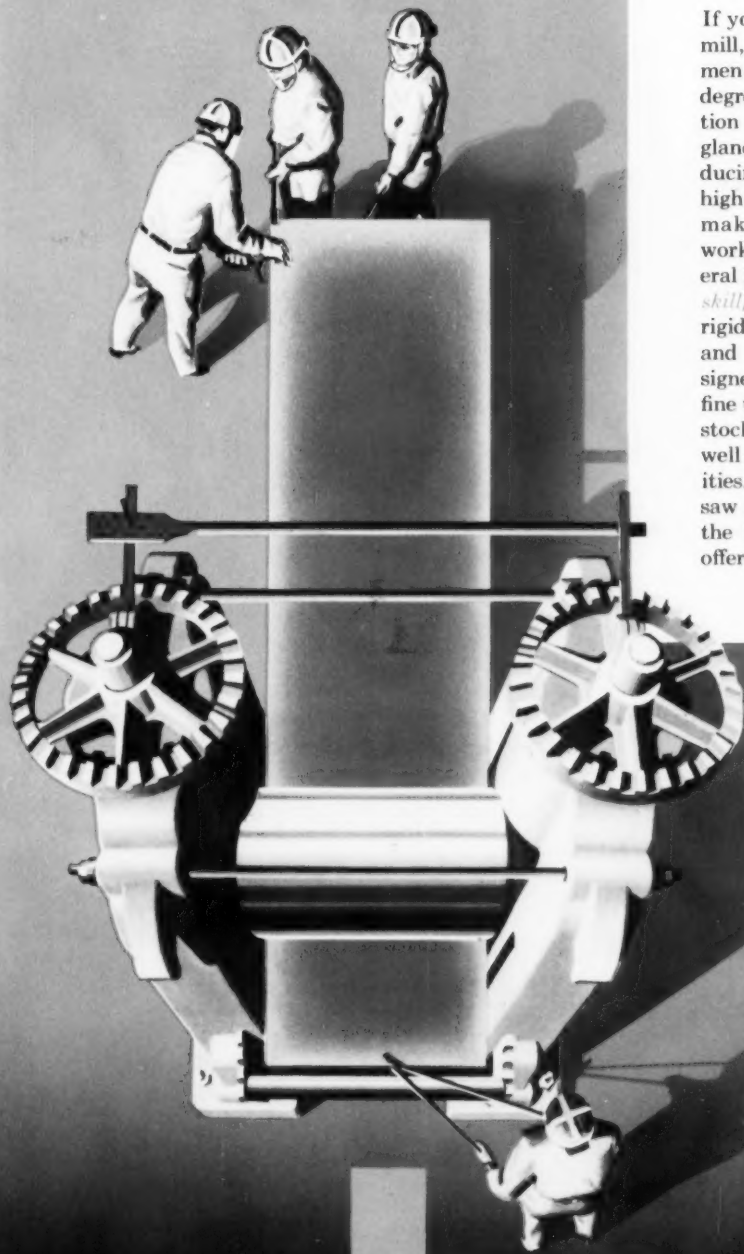
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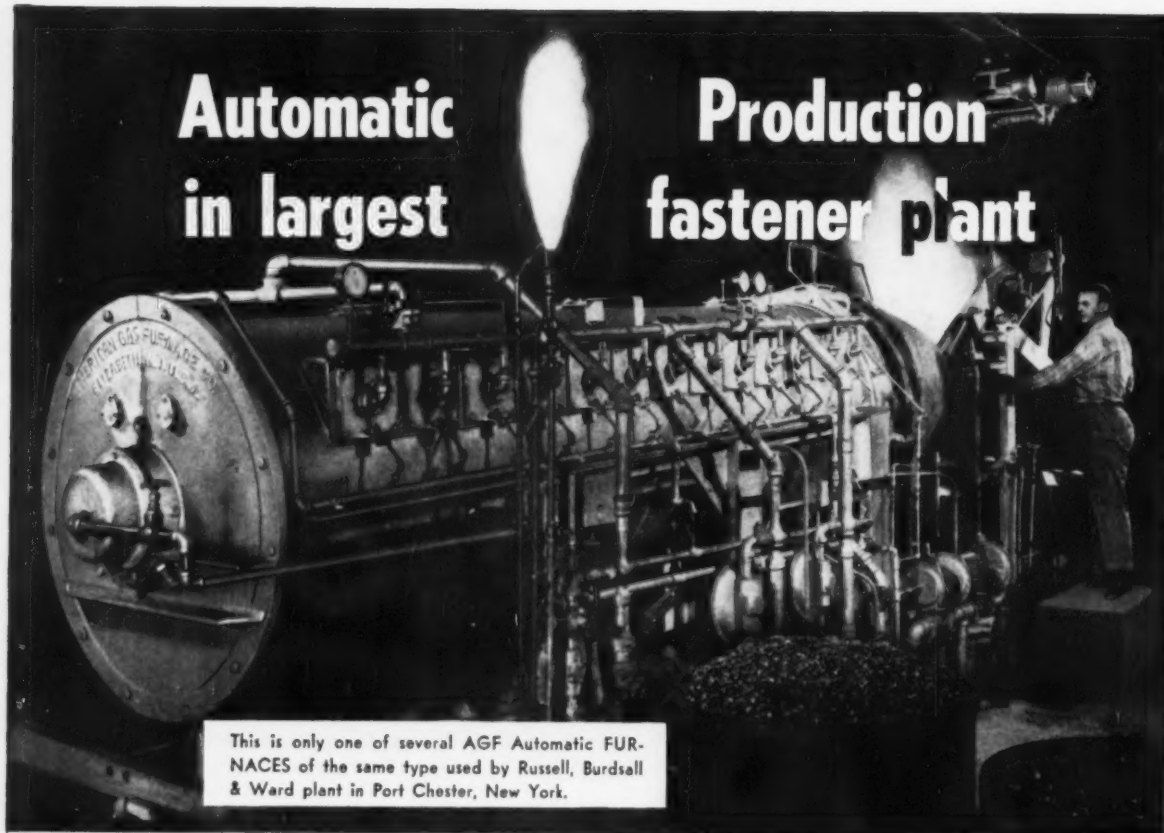
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Small parts manufacturers have found that AGF Automatic Furnaces, substantially cut hardening costs whether their production need is under 150 pounds or over 800 pounds per hour. The clean and uniform results are due to rotary action of the retort which mixes the work, eliminating all possibility of overlap or "hot spots" . . . an exclusive AGF feature.

The entire system can be engineered by AGF Metallurgists and Engineers at a minimum cost to you. Talk it over with the direct factory representative in your area. There's no obligation and no requirement is too large or too small.



MAIL COUPON

AMERICAN GAS FURNACE CO.
1004 Lafayette St., Elizabeth 4, N. J.

My Name
Company
Street
City
Please send Bulletin No. 139
Have Factory Rep. Call
Our Requirement is



"PIONEER manufacturers of Industrial
Gas Heat Treating Equipment since 1878"

FREE LITERATURE

This section starts on Page 108

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Sheet Metal Units

Power operated machines for plate and sheet metal work are reviewed in a 40-page booklet. Pocket-sized, it contains basic specification charts, tabulated for easy reading. (Niagara Machine & Tool Works).

For free copy circle No. 20 on postcard

Heavy-duty Lathe

For use on rough or precision cuts, a new heavy-duty lathe is announced in a company's literature. The lathe features a 75-hp headstock (it will handle peak loads up to 100-hp) and 24 spindle speeds in true geometric progression from 6 to 750 rpm. It has a 40-in. swing over the bedways and 25 in. over the cross-slide. (Axelson Mfg. Co.).

For free copy circle No. 21 on postcard

Blasting

A folder gives details of a blast cleaner with a vacuum pickup. Illustrations and text explain how it operates. (Vacu-Blast Co. Inc.).

For free copy circle No. 22 on postcard

Welding, Brazing

Ultrasonic fluxless brazing and welding without fusion are covered in a pair of 4-page folders. (Aero-projects Inc.).

For free copy circle No. 23 on postcard

Production Control

Automation and production control are discussed in a two-dozen page booklet. It points out that automation can never be more than an aid to the human mind. When

the figures come off the machines, the human element must step in to analyze and to make decisions. Sound decisions, it explains, cannot be made on tables of figures alone. Complicated figures are useful only when seen in relation, one to another. This booklet tells how a graphic representation system solves the problem. (Wassell Organization, Inc.).

For free copy circle No. 24 on postcard

Valves

Valves for automation in steel mills appear in a 16-page publication. It shows various applications of fluid-control valves. Typical installations are pictured. (Golden-Anderson Valve Specialty Co.).

For free copy circle No. 25 on postcard

Sheet, Strip

A colorful brochure tells how a firm starting in a rented garage in West Haven, Conn., grew into a substantial-sized steel company. It explains how this came about and shows the company's latest modern-day installation and assets. The booklet lists an impressive array of customers and offers potential new customers fine sheet or strip steel in volumes of 10 or a million pounds. (Dolan Steel Co., Inc.).

For free copy circle No. 26 on postcard

Pusher Furnaces

Pusher furnaces are described in an illustrated 4-page publication. It says the manual pusher type units progressively batch heat treat materials requiring a range of 1600° to 2400°F. (C. I. Hayes, Inc.).

For free copy circle No. 27 on postcard

Automation

Maximum automation potential is discussed in a brochure. It explains a method to predict performance of abrasive belts on any metal removal operation (except snagging operations) in advance of any expenditure for materials or equipment. (The Carborundum Co.).

For free copy circle No. 28 on postcard

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 4/4/57

Circle numbers for Free Technical Literature or information on New Equipment:

1	2	3	4	5	6	7	8	9	10
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21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

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FIRST CLASS
PERMIT No. 36
(Sec. 369 P.L. 88.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

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PERMIT NO. 36
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FREE LITERATURE

Diecasting

The fourth issue of a European zinc alloy die casting bulletin deals with the field of light engineering. (Zinc Development Assn.).

For free copy circle No. 29 on postcard

Magnetic Tapes

Silicon iron magnetic tapes are discussed in a bulletin. (Thomas & Skinner, Inc.).

For free copy circle No. 30 on postcard

Repeat Cycle Timers

Three basic miniature repeat cycle timers are described in a bulletin. It lists dimensions for ac, dc, and 400-cycle units. (A. W. Haydon Co.).

For free copy circle No. 31 on postcard

Gaskets

Washers, gaskets, shims, seals, and spacers made of colorful plastic are illustrated in a data sheet. This plastic material is tough and stable, it says. It is produced in 12 gages from 0.001 to 0.030. (General Gasket, Inc.).

For free copy circle No. 32 on postcard

Jigs, Fixtures

A 4-page catalog covers 400 components for jigs and fixtures, including three new types of toggle shoe clamps. (Northwestern Tool & Eng. Co.).

For free copy circle No. 33 on postcard

Taxes

What an individual state may spend and receive in taxes five or ten years from now can be estimated with the help of a new 16-page analysis. (The Tax Foundation).

For free copy circle No. 34 on postcard

Wire Cutting

A new automatic wire cutting and stripping machine is covered in a firm's reading matter. (Eubanks Engineering Co.).

For free copy circle No. 35 on postcard

Tubing

Corrosion and high temperature problems are discussed in technical data sheets. These offer up-to-date information on Croloy 27-4-1 (Type 329) in tubular form, and Croloy 25-12 (Type 309S). (Tubular Products Div., Babcock & Wilcox Co.).

For free copy circle No. 36 on postcard

Conveyor

Slider board belt conveyors suitable for conveying materials over horizontal distances of up to 300 ft are described in a firm's literature. The conveyors provide smooth travel with a minimum of frictional resistance. (Sprout-Waldron & Co., Inc.).

For free copy circle No. 37 on postcard

Epoxy Resin

Described from start to finish in a bulletin is a system for making glass-laminated epoxy, resin impressions for use in metal working, and model and pattern reproducing. (Smooth-On Mfg. Co.).

For free copy circle No. 38 on postcard

Cold Forming

A 4-page folder describes a die-form process for cold forming steel bars. Among principal advantages of the process, according to the folder, are a one third savings in steel, lower scrap losses, less machining time, and lower shipping and storage costs. (Republic Steel Corp.).

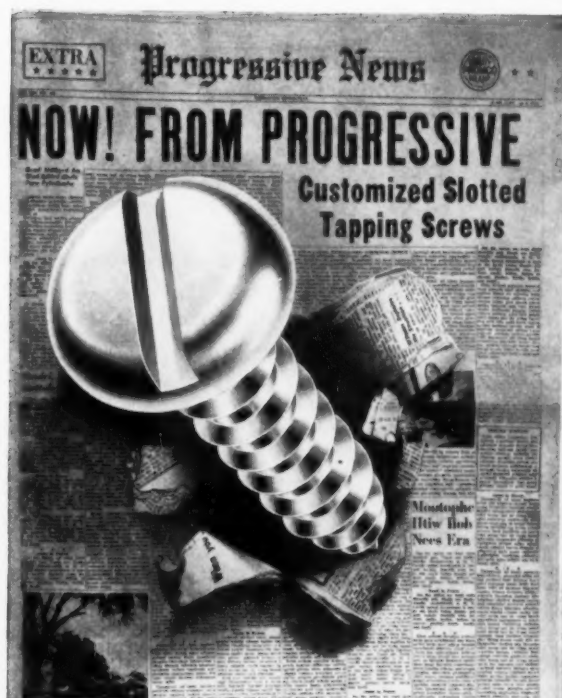
For free copy circle No. 39 on postcard

Plant Location

Authoritative and helpful, a new booklet explains the benefits of locating in Pennsylvania. It tells of plant location services for manufacturers, distributors, engineering firms and management consultants. Advantages of setting include: labor, markets, transportation, industrial sites, financing, production materials, minerals, water supplies, fuel, existing industry. (Pennsylvania Dept. of Commerce).

For free copy circle No. 40 on postcard

The news is really sizzling about...



PROGRESSIVE's *Customized* FASTENERS



Now you can get from PROGRESSIVE, these fasteners with an extra customized touch — fasteners which are custom-made to your order. This means: (1) specifically made for you — not bin stock parts; (2) fast, custom-handling of every order; *plus* (3) the double economy of low initial cost *and* the savings in your assembly operations possible only with high precision, torsion-tested fasteners.

STANDARDS AND SPECIALS CUSTOMIZED FOR YOUR NEEDS

THE PROGRESSIVE MFG. CO.

DIVISION OF THE TORRINGTON COMPANY

78 Norwood Street, Torrington, Connecticut

Superalloy Stands Up to Higher Heats for Jet Aircraft Service

Critical components in supersonic aircraft engines must withstand terrific temperatures.

The race is to discover new materials to retain strength at ever-higher temperatures.

■ A new high-strength, high-temperature metal described as "a significant advancement in the field of gas turbine disk materials" has been developed by Westinghouse Electric Corp.

The new material, referred to

simply as W545, is an alloy of six essential elements, Westinghouse's Materials Engineering Dept. reports: Iron, nickel, chromium, and in smaller proportions, molybdenum, titanium, and boron. Thirty-five-hundred-lb ingots of the metal have been made on a pilot plant scale at Westinghouse's new metals manufacturing plant at Blairsville, Pa.

Target in designing the metal was to find a material which would help push back the heat barrier affecting jet supersonic aircraft.

Explanation—Impact heating, or excessive heating of jet planes as they smash faster and faster into the onrushing air, creates many serious problems both in the gen-



Graphic demonstration shows atoms group in orderly fashion.

eral structures of the planes and in jet engines which power them. Impact heating is now a major consideration in the design of the inlet and compressor of modern jet engines. Titanium is helping lick some problems.

But a second "heat barrier" exists back in the turbine section of the engine, and presents a more difficult problem for the turbo-jet designer. As a general rule, it's increasing temperature of the air passing through the engine that in-



An unretouched photograph showing Laminated NOTAT TIRES performing under adverse conditions over aluminum clippings.

Now there are THREE kinds of tires . . . pneumatics, solids and Notats (Notats are neither solid nor pneumatic—they're LAMINATED!) This means that Notats can't go flat like pneumatics (there's no air chamber). And — unlike solid tires — Notats will "give" to prevent jarring of loads and damage to equipment. At in-plant speeds, Notats ride and steer like pneumatic tires. Notat's molded-together pads grip instead of slip . . . give faster starting, faster stopping.

For longer tire life, easier steering, better traction and no tire trouble, switch to NOTATS. In sizes from 4.00 x 8 to 9.00 x 24. Write for price list and catalog.

THE ORIGINAL LAMINATED TIRE
— ACCEPT NO SUBSTITUTES



**NOTAT
TIRE COMPANY**

1504 EAST 34th STREET
CHATTANOOGA, TENNESSEE

**NO
FLATS
with
NOTATS**

The Plant Engineer of General Smelting Company (Philadelphia) reports: "Flats in pneumatic tires cost us too much down-time loss. We tried solid tires, but they were too hard on the men and equipment. Then we heard about Notats and tried them. They've solved our problem . . . no flats, no down-time due to tire trouble, yet they ride and grip like pneumatics".



Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

creases the engine's thrust, and the plane's speed.

Stands High Heat—Used structurally in the turbine section of the jet engine, where the hottest moving parts are found, the new material permits higher temperatures without significant losses in mechanical strength. It may permit 100 mph faster speeds.

Westinghouse says W545 is basically a modified version of Discaloy, a high-temperature alloy it



Operator pours a melt of the new high-temperature alloy.

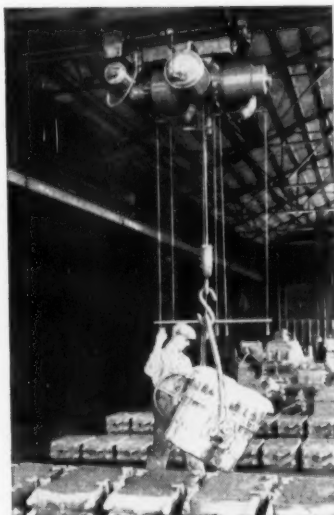
developed a decade ago, and an excellent turbine disk material in its own right.

A jet engine turbine disk is the metal "hub" wheel at the aft end of the rotating shaft of the engine. Anchored to its outer rim are some 50 or more turbine blades. White hot gasses pushing against the blades spin the disk and shaft at speeds to 20,000 rpm. The disk undergoes stresses as great as 50,000 psi.

Study Corrosion

Fresh studies of atmospheric corrosion's effects on non-ferrous metals and alloys are being undertaken. An extensive new ASTM program calls for the exposure of many of the newer alloys and some of the metals such as titanium, which have recently become of commercial importance. Exposures at widely separate points will provide both mild

WHICH HOIST fits your plant's needs?



**SHEPARD NILES
FLOOR-OPERATED HOIST**

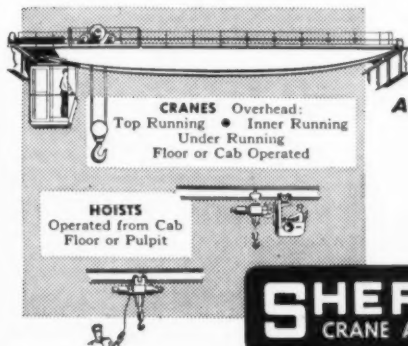
Operator primarily occupied with other duties. Uses hoist for fast, efficient handling of relatively short hauls.



**SHEPARD NILES
CAB-OPERATED HOIST**

Operator in cab moves loads along at high speeds, occupies best vantage point for spotting and stacking material.

THE RIGHT HOIST . . . can reduce your plant's handling costs. But which one is best for the job . . . a floor-operated hoist where the operator is freed for other duties or a cab-operated hoist where he is engaged fulltime moving loads through the air? Because Shepard Niles manufactures both types of hoists . . . as well as a complete line of cranes . . . we can approach your handling problem with an open mind.



● Send for Bulletins describing Shepard Niles Cab and Floor-Operated Hoists. And request our representative to call.

America's Most Complete Line

of Cranes and Hoists

Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION

1488 Schuyler Ave., Montour Falls, N.Y.

TECHNICAL BRIEFS

and severe marine exposures, rural and an industrial atmosphere exposures.

Plans call for removal of specimens at the end of two, seven, and up to 20 years.

Magnetic Grates Boost Refractory Output

Magnetic grate separators in use by a refractories maker increase production, give a better appearing product, save 12 man-hours daily and offer an increase in the efficiency of the screening operation.

As installed at North American Refractories Co., Curwensville, Pa., a magnetic grate intercepts the flow of finely ground refractory clays just before they feed into electrically heated vibrator screens. Sifting through the Alnico-V-powered magnetic tubes composing the grate, the entire flow of material is subject to an automatic search for fer-

rous particles. These are instantly aligned to the surface of the tubes and securely held. The grate re-



This grate removes 10-lb of iron daily from refractory clays.

moves approximately 10 lb of iron daily.

Without the magnets, says the user, they couldn't increase the temperature of the screens for maximum efficiency. The tramp iron in the clay previously caused shorts

and burned holes in the screens at high temperatures. The magnetic grate removes this problem entirely.

The permanent magnetic grates are developments of Eriez Mfg. Co., Erie, Pa.

Rubber Wheel Extends Abrasive Belt Life

A new rubber contact wheel increases abrasive belt life as much as 40 pct on backstand grinding and polishing operations. So reports its developer, Minnesota Mining & Mfg. Co., St. Paul, Minn.

Made with a slashed serration, the "X"-wheel is formed from a new highly abrasion resistant neoprene. An improved flange construction eliminates possibility of misseating the flange. It is an intricate part of the wheel and prematurely attached to the hub.

Wide Lands — Because of the new type of serration, the wheel has wider-than-usual lands. This provides more rubber surface for long wear, but with no sacrifice of conformability or ruggedness.

The wheel is finding application in off-hand weld removal, grinding and polishing of gates and parting



Slashed serration results in wider-than-usual lands.

lines, snagging and finishing on fabricated metal parts. It comes in a 14-in. diam with 1, 2, 3 and 4-in. widths, and in several durometer hardnesses. The developers of the item, however, believe that 80, 55, 35 and 20 durometers are suitable

Perforations perplexing you?

MASONITE? PLASTIC?
METALS? RUBBER?



If you have a design problem that's got you down maybe Hendrick can be of help. Sometimes the easiest and quickest way to enhance a product's beauty is to include a pleasing pattern of perforations in its design. Hendrick perforated metal not only helps increase a product's overall attractiveness, but also adds to its saleability as well. And whatever material you're using . . . whether it's metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes you can draw on Hendrick's long experience and perforating facilities to fill the bill. Write for details.

...better call HENDRICK

Hendrick
MANUFACTURING COMPANY



37 DUNDAFF ST., CARBONDALE, PA. • Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot and Wedge Wire
Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

for most applications in industry.

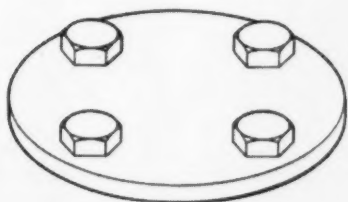
The wheel is made by, and is available from Chicago Rubber Co., Waukegan, Ill.

Three Bolts Do Work Of Four

Position three bolts 120 degrees apart around a common center and they'll provide as stable a joint as the conventional pattern of four bolts arranged symmetrically.

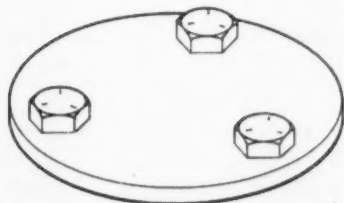
So say fastener experts of Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y.

Savings in assembly—made possible by fewer holes to drill and fill—make the three-bolt joint more



**Why use four bolts to do a job?
Ask fastener specialists . . .**

desirable. At the same time savings in cost of fasteners are significant, too. Holding capacity lost in using fewer bolts is made up by using stronger ones. This alternative still permits savings in the cost of fast-



. . . when three bolts can sometimes do the job just as well.

eners. For example, either four 3/4-in. bright cap screws or three 3/4-in. high tensile bolts may be used to carry an 80,000 lb load safely. But three of the high strength bolts cost less than four of the cap screws.

AUTOMATION at work ...supported by ACME Weldments



18,240 operations — 80 automobile transmission cases every hour! That adds up to quite a day's work, but it's no problem for this transfer machine built by the Baush Machine Tool Company of Springfield, Massachusetts. Unusual sectional design permits rapid retooling, keeps work handling to a minimum, and speeds production in many of America's largest automotive plants.

To provide the *strength* and *rigidity* required by this complex, automatic machine, Baush engineers specified all-welded steel bases fabricated by *Acme Welding*. Beside being stronger these Acme weldments are lighter and make possible the incorporation of many exclusive design features. Perhaps these advantages of Acme weldments are important to your product . . . whatever your requirements, why not call on Acme today.

A. S. M. E. U68-U69 Qualified Welders • A. P. I. - A. S. M. E. Approved
Underwriters Label and Inspection Service • Navy Approved
National Board Approved • Hartford Steam Boiler Inspection Service

Send us your blueprints for a prompt quotation and ask for our informative booklet, "WONDERS OF WELDED FABRICATION"

Acme WELDING

DIVISION of THE UNITED TOOL & DIE CO.

1044 NEW BRITAIN AVE., W. HARTFORD, CONN.

TECHNICAL BRIEFS

Good Grip—In terms of holding power, the stronger the bolt, the less it costs. RB&W engineers calculate that a dollar's worth of holding power in high tensile bolts costs \$1.50 when bright cap screws are used and \$1.65 with machine bolts.

High tensile bolts are identified by three radial dashes on the bolt head. They have a high carbon content and are heat treated to increase strength. They are rated at 120,000 psi tensile strength.

Bright cap screws, identified by their bright finish, are produced to rigid dimensional tolerance and are rated at 68,000 psi.

When To Switch—Machine bolts have a tensile strength of 55,000 psi. As the least expensive per piece, they are recommended where their strength is sufficient and use of stronger bolts would not reduce the number required.

Operator Watches Arc Furnace In Viewer

In the comparatively recent development for production of pure titanium and other metals, manufacturers have been confronted with the problem of protecting operating



Cutaway illustration shows how the viewer is set up.

personnel during the process of ingot production in consumable arc furnaces.

Engineers of American Optical Co., Buffalo, N. Y., have designed

and built what they believe to be a unique answer to this. It is a remote consumable furnace viewer which permits safe observation, through optical means, of the travel of the electrode. The viewer fits over the viewing port of the furnace so that the operator can stand safely outside a concrete barrier and study the image of the electrode on an 8-in. ground glass screen through a safety glass window.

Visual Control—The electrode can be visually followed from about 1 ft downwards to a maximum of 10 ft. The image size varies from about 1.5-in. at a two foot working distance to approximately 6-in. at 4 or 5 ft, since magnification of the image changes with respect to the distance between the image and object.

The remote consumable furnace viewer was originally custom designed for Electro Metallurgical Co., Niagara Falls, N. Y. They now have two in operation in connection with the laboratory arc melting of several metals, including titanium.



ARMSTRONG

GENERAL CATALOG NO. 57

Listing approximately 5,000 quality tools for industry, including:

- ★ Tool Holders (The complete Armstrong System)
- ★ Cutting Tools (Tool Bits, Cut-off Blades, Carbide Cutters and Inserts)
- ★ Lathe and Milling Machine Dogs
- ★ Set-up and Hold-down Tools
- ★ Machine Shop Specialties
- ★ Drop Forged "C" Clamps
- ★ Parallel and Machinists' Clamps
- ★ Drop Forged Eye Bolts and Hoist Hooks
- ★ Drop Forged Machine and Crank Handles
- ★ Drop Forged Wrenches
- ★ Detachable Sockets and Drive Parts
- ★ Bridge Ratchets and Sockets
- ★ Adjustable Wrenches
- ★ Torque Wrenches
- ★ Pipe Tools
- ★ Chain Tongs

No industry reference file is complete without the new Armstrong No. 57 Tool Catalog.

ARMSTRONG BROS. TOOL CO.
5309 W. ARMSTRONG AVE. • CHICAGO 30, ILL.



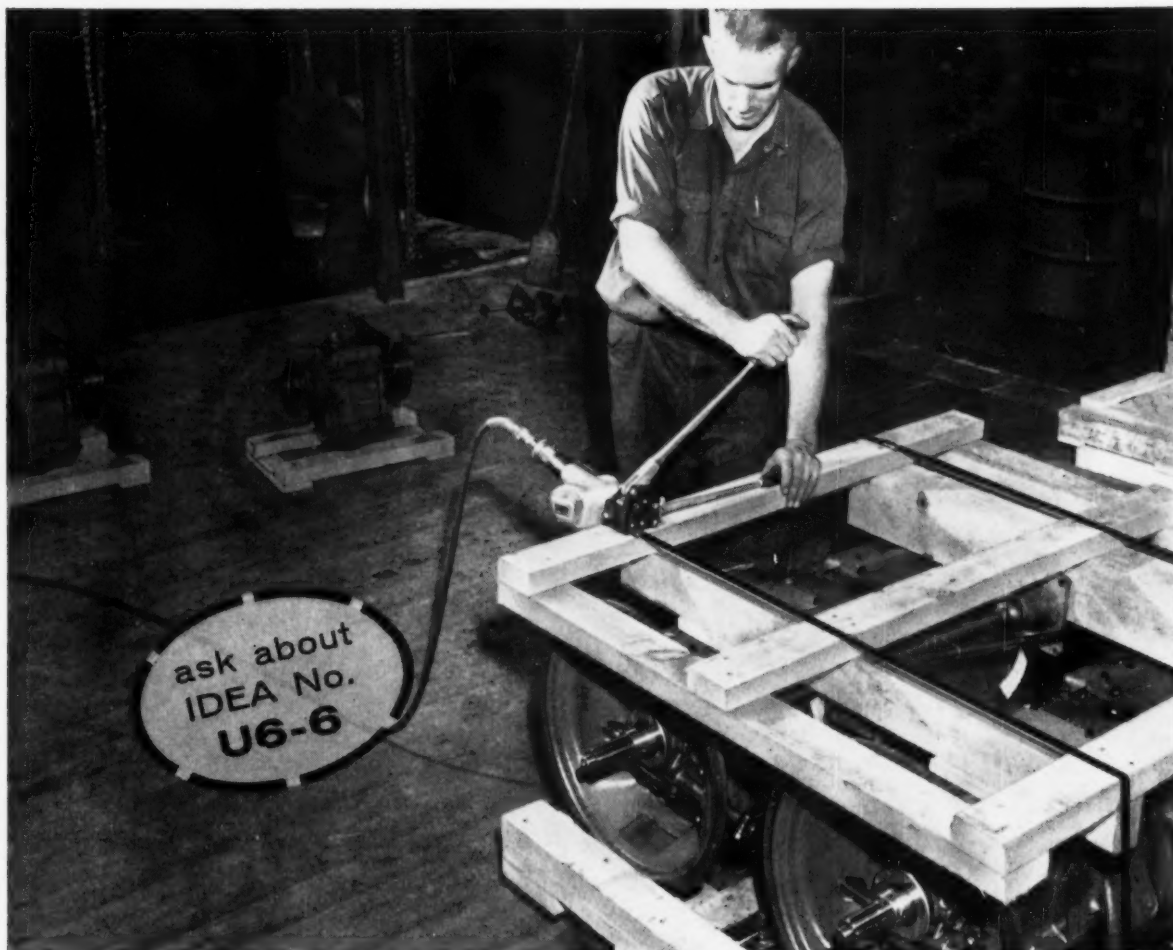
Automated Machine Drills, Rivets

Employing refrigerated slug-type (headless) rivets, a machine now in use by a major aircraft assembler automatically drills and rivets stringers to a 10 x 37-ft wing panel.

Drilling and riveting by automation help to assure fuel tightness so that the wing itself is a tank. Thus, it does away with liners or secondary fuel containers.

No Sealant—In the automatic riveting process, no sealant is necessary. The machine clamps the workpiece in position, drills and countersinks the rivet hole, injects the ice-box slug rivet, upsets the bottom of the slug, upsets the top into the countersink, mills the top head flush with the wing surface, unclamps the workpiece, and resets itself for the next sequence.

A tape command device controls the entire operation. Coded holes punched in seven different channels of a standard 35-mm movie film



**Check your AIM*... Fuller Manufacturing Company did ...
Strapping transmissions saves money, speeds handling**

ACME STEEL STRAPPING helped Fuller Manufacturing Company, Kalamazoo, Michigan, eliminate costly crating and slow manual handling. Now, two transmissions are steel strapped to a wooden skid, with protective top frame. This is accomplished in half the time previously required for the crating operation by the same crew. (Idea No. U6-6)

The steel strapped skid loads are moved by lift truck, can be stacked six high. Appreciable savings in material cost and storage space are realized. And, damage in transit is reduced.

***Check your Acme Idea Man.** His Ideas-In-Action files prove scores of ways to better protect products from production lines to customers. Write Dept. IFU-47 Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Avenue, Toronto 13, Ontario.

Acme Idea Man,
Chuck Deerwester,
cooperated with
Fuller Manufacturing
Co. in adopting this
steel strapping idea.



STEEL STRAPPING

TECHNICAL BRIEFS

pass beneath electrical contacts. This regulates the functions of the equipment. The contacts translate the holes into electric signals. Holes are located on the tape by manually positioning the assembly in relation to the tape. A hand tool does the piercing.

The slug rivets used are straight rods of 2024 aluminum alloy cut to

length with ends squared and chamfered. They do not have sleeves. The rivets are heat-treated, stored at -20°F . These must be driven within twenty minutes after exposure to room temperature. If not, they of course begin to age and are then unsatisfactory for driving.

Squeezed First—Rivets are first squeezed and then vibrated. The machine is capable of performing both operations. More electrical settings are required with automati-

cally controlled vibrating, however. The machine applies a 1500-lb clamp during riveting.

Components of the unit are supported or enclosed in a steel C-frame, 12-ft high with a 10-ft jaw depth. The lower ram of the C-frame heads the bottom of the slug rivet. It provides the high-pressure clamp, and incorporates a



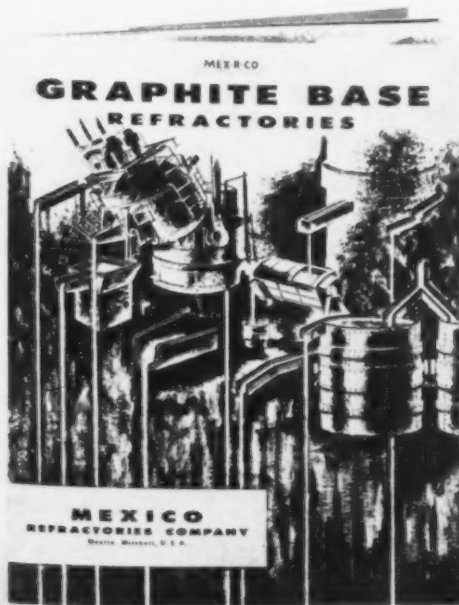
The setup rivets and drills much faster than hand methods.

unique profiling mechanism. This automatically controls the edge distance along the stringer. The upper head of the C-frame contains the drill spindle, mill spindle, and rivet gun with injector fingers.

Handling Frame — A handling frame, to which the wing panel is attached, guides and delivers the workpiece to the exact drill and rivet location. It can move in the vertical, transverse, longitudinal and radial planes. The control of each extremity is independent of the other, permitting the workpiece to be located in any desired position.

Builds Solar Furnace

Now under construction by the army is a large solar furnace capable of producing "temperatures comparable to those generated by an atomic explosion." Probably in operation by this summer, the furnace is being erected at the Quartermaster Research Center, Natick, Mass. It will have the energy equiv-



Why Graphite-base Refractories?

... SEND FOR THIS NEW 24-PAGE BOOKLET

Graphites are not new in metal melting uses—but the perfection of **HELSPOT**, in plastic and brick form, has been accomplished by the MEXICO REFRACTORIES COMPANY. MEX-R-CO products are performance proven in some of the largest steel mills and foundries in this hemisphere.

HELSPOT has proved its ability in higher purity of metal. Many letters from steel men and foundry operators testify to that fact. No other Graphite-base refractory has ever received the acclaim which has been accorded **HELSPOT**.

HELSPOT in composition is a mixture of high grade fire clay, graphite bonded with a unique and special ingredient.

It will pay you dividends in time, money, and cleaner metal to investigate and use **HELSPOT** in your operations.

Send for the new booklet "Graphite-base Refractories". It illustrates many of the recommended applications in steel mills and foundries.

MEXICO REFRACTORIES COMPANY

MEXICO, MISSOURI

NILES FIRE BRICK DIV. — Niles, Ohio

NATIONAL REFRACTORIES DIV. — Philadelphia, Pa. • BIG SAVAGE REFRACTORIES DIV. — Frostburg, Md.
Canadian Affiliate: REFRACTORIES ENGINEERING & SUPPLIES, LTD. — Hamilton, Ontario, Canada

alent of approximately 28-kw.

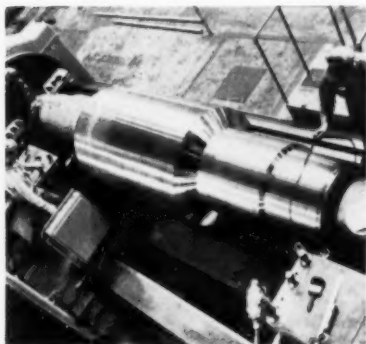
The installation consists of: a heliostat, a concentrating mirror array, an attenuator, and a test chamber, occupying an area about 125 ft long x 40 ft wide. At one end of the assembly is the heliostat, a flat mirror 40 x 36 ft. This receives the sun's rays and reflects them 96 ft upon the concentrating mirror array at the other end of the assembly. The concentrating array consists of 180 curved surface mirrors, each 23.5-in. in diameter.

Like Magnifying Glass—The furnace collects and concentrates rays into a small target area in much the same way as a magnifying glass. The device will be used for testing materials intended for protecting military personnel against the "thermal effects of nuclear and other weapons," says the army.

Tools-Lathe Team Cuts Working, Scrap Costs

Teaming a huge new lathe with carbide tools registered savings in machining time on a giant 60-ton roll. Not only this, but it boosted the producer's quality and price of scrap.

Ohio Steel Foundry Co., Lima, Ohio, now uses a recently installed



Using the tool-lathe team gives the user a machining saving.

German-made lathe with Carboloy grade 370 tools. These remove some 12 tons of steel to reduce machining time from 70 to 18 hours.

An added saving comes in the form of an extra \$10 per ton in scrap. Old hand-lathes used by the

180 Bailey

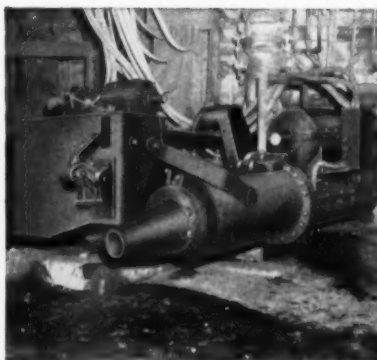
CLAY GUNS

IN CONTINUOUS SERVICE



Here's
Why...

- Exceptional Power
- Accurately Controlled
- Operated by Three Separate Motors



With clay pressures of 600 psi, these guns provide ample power for plugging and maintaining long tapping holes. A unique mounting and operating system assures fast and accurate positioning with the ultimate in safety.

Bailey Electric Plunger Clay Guns are adaptable to both blast furnaces and large electric furnaces.

Write for Bulletin

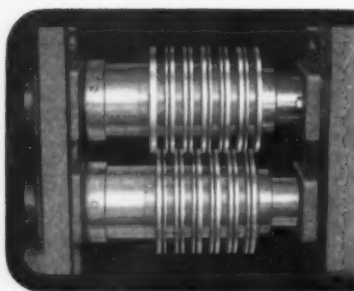


CUT COSTS 3 WAYS!

WITH COWLES SLITTING KNIVES

Cowles knives are so accurate they can be assembled on an arbor quickly with little or no shiming, reducing set-up time. They stay on the job longer, require very infrequent interruption for re-grinding;—and—produce straight edged strip with minimum burr, preventing tie-ups in later forming operations.

For maximum satisfaction, specify Cowles, world's largest manufacturer of rotary slitting knives. Furnished in



any face, diameter and bore, in our Max-Cut; Special Alloy; Super Alloy; Circle C; Super C; or any special analysis for slitting high and low carbon steels, stainless, silicon or non-ferrous metals. Prompt delivery!

Engineering Assistance On Any Slitting Job.

COWLES TOOL COMPANY

2060 WEST 110th STREET • CLEVELAND 2, OHIO

Specializing in the Manufacture of

ROTARY SLITTING KNIVES • SPACING COLLARS • ROTARY TRIMMING KNIVES • ROLL TURNING TOOLS • EDGING ROLLS • CUT-OFF KNIVES STANDARD AND SPECIALLY ENGINEERED TOOLS FOR ALL FERROUS AND NON-FERROUS PROCESSING, TRIMMING AND FORMING REQUIREMENTS.

SILENT HOIST LIFTRUK

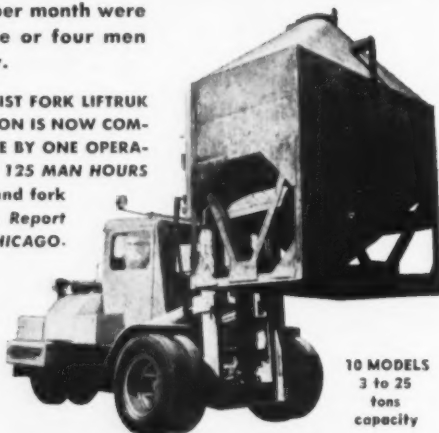


INLAND STEEL IS SAVING approx. 125 MAN HOURS EACH MONTH on JUST ONE SPECIFIC REQUIREMENT

"Four to six cars of carbide per month were formerly unloaded by three or four men working eight hours per day.

"THROUGH THE USE OF SILENT HOIST FORK LIFTRUK Model FK 7½, THIS SAME OPERATION IS NOW COMPLETED IN A PORTION OF THE TIME BY ONE OPERATOR . . . SAVING APPROXIMATELY 125 MAN HOURS PER MONTH" . . . releasing men and fork truck for other useful purposes. Report from INLAND STEEL CO. EAST CHICAGO.

SILENT HOIST LIFTRUK is a real work horse — operates long periods without maintenance — on muddy or irregular terrain. STANDARD EQUIPMENT includes Fluid Drive, Power Steering, High Undercarriage, extra large torque multiplier for traction.



10 MODELS
3 to 25
tons
capacity

Ask for Bulletin No. 77.

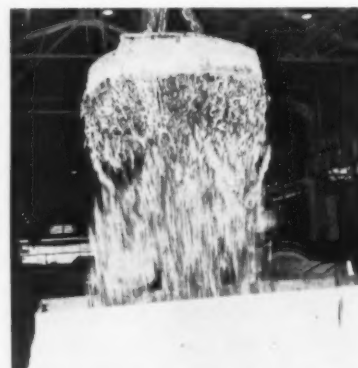
SILENT HOIST & CRANE CO.

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.

TECHNICAL BRIEFS

company previously produced chips, virtually 7-in. splinters. These are too thin to remelt properly.

Chips produced today are 100-



Using the tools-lathe team also gives the user a scrap saving.

pct furnace chargeable. The firm, thus, is no longer forced to purchase scrap at current market prices per ton, while selling theirs below market prices.

Pre-Plating Bath Coats In One Pass

An improved zincate bath for the treatment of aluminum prior to plating has been developed by Northwest Chemical Co., Detroit.

According to H. J. McCracken, President of the company, the new product, Alkalume Pre-plate provides a bath that is effective, economical and simple to operate for any type of plating.

Advantages?—Features claimed for Alkalume include the ability to deposit an extremely fine grained, uniform coating in one pass; elimination of adhesion problems; low surface tension resulting in faster draining and reduced dragout; and tolerance for chrome for continuous operation and longer life.

The chrome is converted to a harmless form that eliminates the disposal problem. Alkalume is harmless to rack coatings and has no objectionable odor. Its amber color provides a visible check on the effectiveness of the rinsing.

Does your Board of Directors listen to this man?



He doesn't try to tell your Directors how to run the company. That's their job, and he respects it.

But it will pay them to listen to him when he talks about advertising for your company. That's his job!

Your Advertising Manager is a man who knows markets. He knows the science of "mechanized selling." He knows how to help turn sales goals into sales. He has the tools and the know-how to make major contributions to your company's progress and profit.

Take your Advertising Manager into your confidence. Put him on your first team. Let him manage. He can help your sales force sell more economically.

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

271 Madison Avenue, New York 16, N. Y.



An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS-FORT WORTH, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS-ST. PAUL, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PITTSBURGH, PORTLAND, ROCHESTER, ROCKFORD, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., YOUNGSTOWN.

Caulk, Seal, Join Materials With Synthetic Compound

Chemically-produced materials for caulking, sealing and joining materials have come a long way in a short time.

Weigh the merits of this material against your needs.

A synthetic rubber compound works equally well as a caulking, sealing and joining compound for metal, glass and concrete. Building Products Division of L. Sonneborn Sons, Inc., New York, makes the material.

The liquid material is made up of

sulfurized rubber polymers furnished with an activating agent. This cures the liquid to a rubber-like substance after it is introduced to the joint to be sealed. The compound thus becomes a resilient part of the joint structure for the life of the building.

Properties—The sealing and caulking product is non-shrinkable. It is also impervious to the effects of air, moisture, salt spray and sunlight, possesses the property of "cold flow," and complies readily with distortions of panels caused by extremes of temperatures.

The company's research people have thoroughly tested the product under field conditions and found it measures up well. Beads approximately $\frac{3}{8}$ in. deep and $\frac{1}{2}$ in. can be stretched to four times their width without damage to adhesion or continuity.

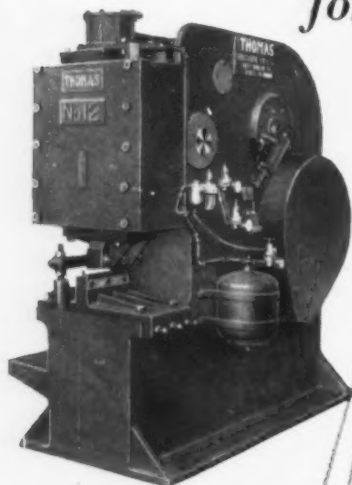
Varied Uses—Recommended applications for the sealing compound are in construction requiring outstanding adhesion, weathering resistance, elasticity, extreme temperature ranges, oil resistance and durability. It also can be used in many types of tanks, boxes and screens as a filler or gasket, and is recommended for boat and aircraft seams.

The product was developed largely to meet curtain-wall construction requirements, the structural use of glass, metal, ceramic-coated metal or thin stone sections.

THE TREND IS TO THOMAS

for

production
cutting
of bars or angles



Machine is shown tooled for flats. Modern Thomas design makes this machine a compact, space-saving, self-contained unit for shearing or punching.

This all-steel Thomas machine is available in capacities of 50 through 600 tons. It can be supplied with tools for shearing flats, rounds or angles, or fitted with punching tools.

THOMAS
MACHINE MANUFACTURING CO.

PITTSBURGH 23, PA.

Punches • Shears • Presses • Spacing Tables • Benders

Enamel Dries Extra Fast

A new extra-fast-drying enamel for use on all types of machinery and equipment is said to offer the durability of enamel and the ap-



New resins speed enamel drying

plication and drying speed of lacquer. This is achieved through use of new type resins developed specifically for incorporation in fast-drying paints.

Called BoGard Rapid Dry, the material is produced by Body Bros., Inc., Bedford, O. It air dries in 15 to 20 minutes. This makes it particularly adaptable for use in field shops or in locations where excessive dust makes the use of ordinary paints impractical.

Dries Hard—The material dries thoroughly, with no "back tack" or stickiness. Spray coats can be either air-dried or baked. It is also suitable for brush touch-up use.

The enamel offers good weathering and color retention qualities, and produces a high-gloss, durable, and attractive finish. It's available in all standard commercial colors or in colors to match existing specifications, in 5-gal cans or 55-gal agitator drums.

Aluminum Solder Needs No Flux

A fluxless aluminum solder may open the way to wider use of aluminum in handsawable tubes, bars, shapes, etc.

Announced by All-State Welding Alloys Co., Inc., White Plains, N. Y., the solder is lead-free. It offers high strength—up to 20,000 psi tensile in a mitered joint. No galvanic action occurs between solder and base metal . . . color match with aluminum is good, and low-skill applicability is possible with any form of heat that will raise the temperature to 720°F, where the alloy flows freely.

No Flux — Designation is All-State No. 55 Rubbon aluminum solder. The alloy rubs on without a flux. Best bond is obtained by simply heating the cleaned base metal enough so the solder melts when it is rubbed on the surface. This thoroughly tins the surface. Joining is accomplished by heating two tinned surfaces held firmly together.

from tea strainers...



to catalytic crackers...

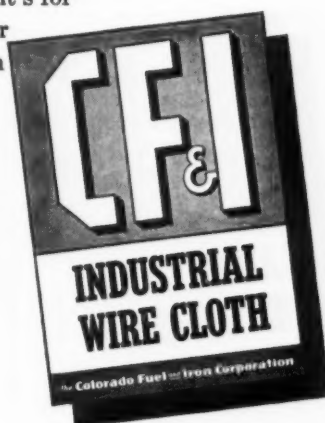
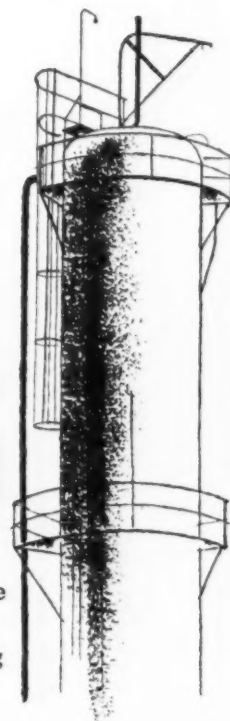
you will find



INDUSTRIAL WIRE CLOTH

It's a versatile product, this CF&I Industrial Wire Cloth. For it plays an essential part in the tiny tea strainer and in the oil refinery's huge catalytic cracker. Chances are that you're using it—or could be using it—to good advantage right in your own operations.

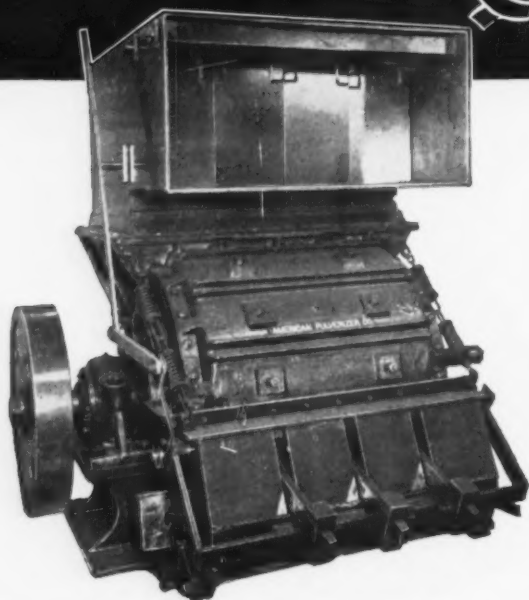
CF&I Industrial Wire Cloth will meet your most exacting specifications—whether it's for screening, filtering, grading, cleaning or processing. That's because CF&I Cloth comes in a wide variety of weaves and meshes and can be supplied in non-ferrous metals, as well as carbon and alloy steels. Why not get the complete details from your nearby CF&I representative today!



THE COLORADO FUEL AND IRON CORPORATION: Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita • **WICKWIRE SPENCER STEEL DIVISION:** Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia • **CF&I OFFICES IN CANADA:** Montreal • Toronto • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

3675

Here's A Curly Cue To New Market Value For Your Machine Turnings



American METAL TURNINGS *Crusher*

That single machine turning of curled-up steel shown above can be mighty troublesome and costly to your operations.

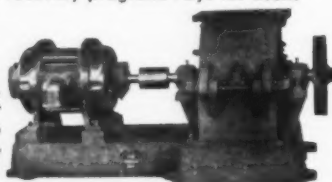
Gnarled up with thousands of others like itself, it becomes a problem in space . . . gallons of re-usable cutting oil are trapped in the folds . . . and the scrap value is greatly minimized.

Answer? Run this tangled waste through an efficient, AMERICAN METAL TURNINGS CRUSHER. Out come sized chips that are easy to handle for shoveling or pneumatic handling . . . easy to store (savings in space up to 75%) . . . easy to spin for oil recovery . . . and crushed turnings command a higher price.

The cost is easy, too, on your scrap recovery program. Pays for itself. WRITE for illustrated literature.

RECLAIM FUSED WELDING FLUX

American Hammermill reduces fused flux to fine regranulation for perfect re-use. Why throw away profits! Details on request.



WRITE for Coal Crushing Bulletin

1439 MACKLIND AVE. • ST. LOUIS 10, MO.

MATERIALS ROUNDUP

The material is reported to be lowering costs in several important ways. These include 1) reduction of rejects, 2) reduction of rework, 3) elimination of post cleaning, and 4) lessening of operator-skill requirement.

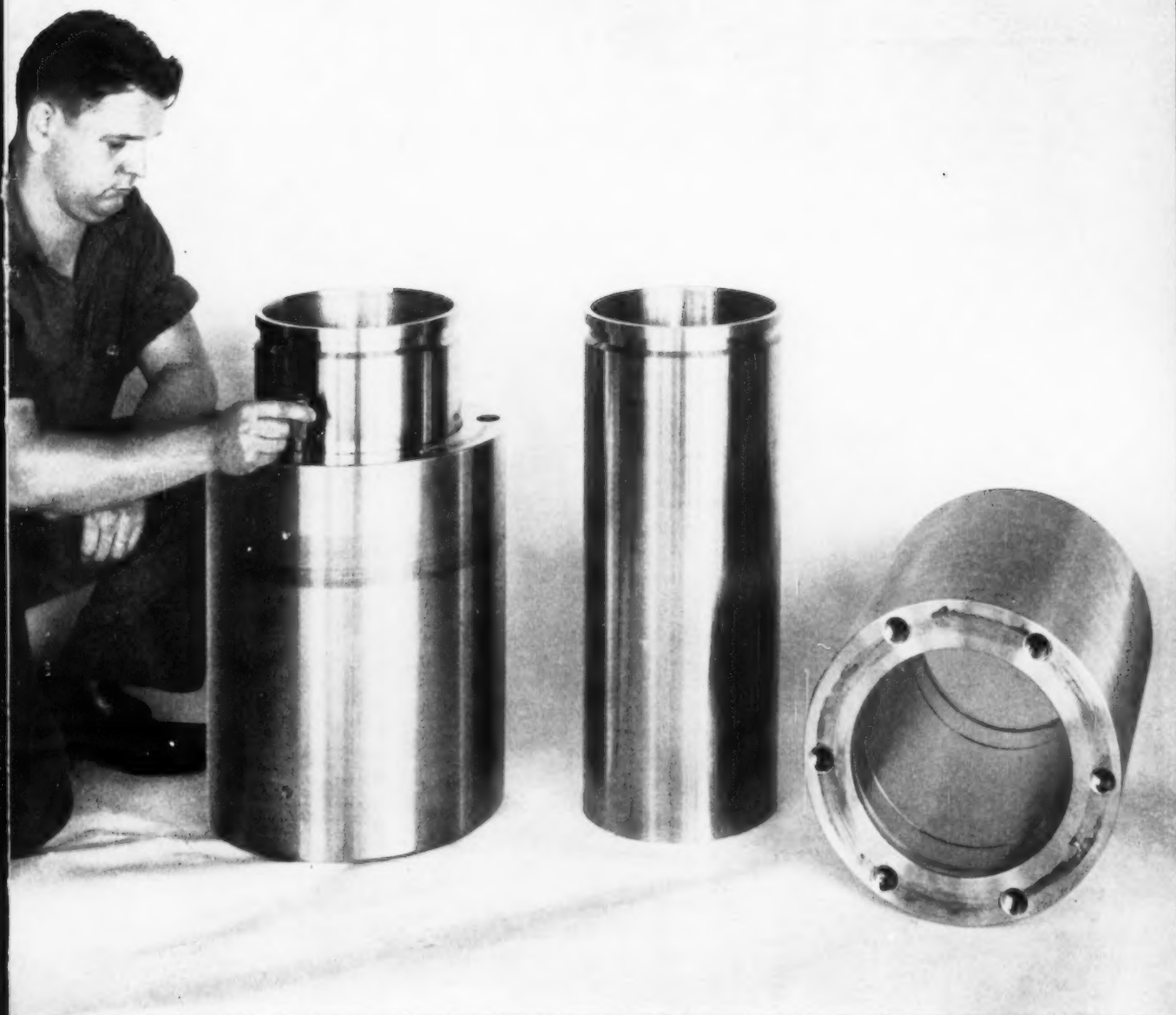
Wider Usefulness—Rods of No. 55 are $\frac{1}{8}$ x 18 in., and are packed 10 or 15 lb to the box. It is useful for work on several other metals besides aluminum. Zinc base die casting alloys, copper and steel are some of them.

Contact Adhesives Up Bonding Speeds

Production-line techniques are now possible in more and more industrial laminating operations, thanks to the latest developments in the field of chemical bonding. New contact adhesives featuring easy sprayability, fast-drying, and high early strength are eliminating the need for clamps, presses, complicated heat-curing schedules and other procedures which slow production.

Typical of such adhesives is Hybond "56". Recently introduced by Pierce & Stevens Chemical Corp., this is a fast-setting, solvent-type, synthetic rubber compound designed for industrial bonding operations on high-speed production schedules. It is suitable for most types of dissimilar lamination involving steel, aluminum, plastic laminates (Formica, Textolite, etc.) fibreboards, leathers, wood, fabric, rubber, and honeycomb.

Strong Bond—According to the manufacturer, Hybond "56" produces an odorless, non-staining bond featuring high dead load strength, yet sufficiently elastic to resist shock and fatigues. These characteristics are particularly desirable in laminating surfaced countertops, desks and tables, as well as porcelainized metal chalk boards and wood.



WHO FORGES THE TOUGH ONES? & machines them, too

Suppose you had to have a coupling, such as the one above for a ship shaft, machined so accurately that the two parts fit to each other with 90% surface contact. Where would you go to have the forging and machining done? You know, there aren't many companies that can make forgings that big, and there aren't many that can do such precision-finish machining. But we are a company that does both!

A job such as this is not a "special" with us, for we've been producing big forgings for over 40 years. And

the thing our customers like best about us is that we can handle the whole job—from basic steel to finished product—all in one completely integrated plant. We'd welcome the chance to quote on your next job for big machined forgings—and to demonstrate the answer to "who forges and machines the tough ones . . . best?"

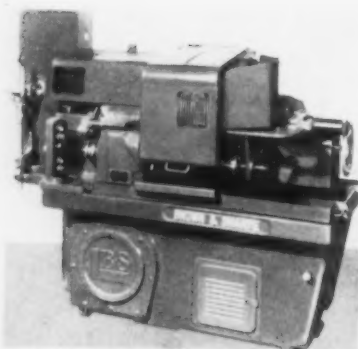
NATIONAL FORGE
AND ORDNANCE COMPANY

IRVINE (WARREN COUNTY), PENNSYLVANIA

To see more of "the tough ones," and the machinery they're made on, write for Bulletin NFO.

New Production Ideas

Equipment, Methods and Services



Automatic Screw Machine Is Fast, Accurate

This brand new automatic screw machine is said to be fast and efficient. It features high sustained accuracy along with little maintenance. Three different capacity models work $\frac{3}{4}$, $1\frac{1}{4}$ or $1\frac{1}{2}$ in. diam stock. For turning, forming or one-chip finishing, to $2\frac{1}{2}$ -in. length ($3\frac{1}{2}$ -in. with lower drive-shaft speed), the machine tool holds limits to 0.0005-in. A wide range

of 18 high spindle speeds is available. It has a top speed of 5050 rpm on the $\frac{3}{4}$ -in. capacity spindle, 3500 on the $1\frac{1}{4}$ and 2450 on the $1\frac{1}{2}$. For each high speed 11 or 12 low speeds can be used in combination, in ratios from 2.2:1 to 15:1. Three of the new machines can do the work of four older ones, the maker says. (Brown & Sharpe Mfg.)

For more data circle No. 41 on postcard, p. 113

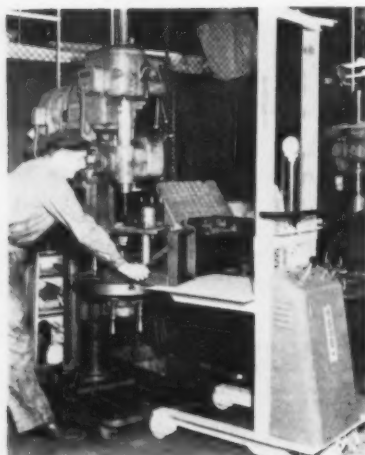


Light-duty Fork Trucks Turn In Narrow Aisles

High maneuverability where operating conditions aren't too severe is the key feature of new electric fork trucks. Two models are available: one has 5000-lb capacity, the other 7000. The maker recommends them for normal and light-duty applications. Under such conditions, the added expense, weight and size of a heavy-duty truck for the maximum capacity are unnecessary unless such severe operating conditions as rough surfaces or steep ramps are present, the manufacturer

points out. Under normal conditions, the trucks are generally capable of handling capacity loads and shorter turning radii than larger size handlers. The units incorporate the same rugged power and steering axles, motors, braking systems, heavy-duty controls, steering system and other features of the maker's heavy-duty line. Standard lift height is 120-in. The models have speeds up to 5.5-mph and lowering speeds to 120-fpm. (Baker-Raulang)

For more data circle No. 42 on postcard, p. 113



Battery Operated Hydraulic Elevator Lifts Work

When properly applied, this portable elevator can get more work done by making jobs easier for workers. With a flip of a lever, the battery-operated elevator lifts loads up to 750 lb. with no help from the operator. The hydraulic system for raising the lowered platform maintains low pressure under its maximum loads, assuring minimum wear on packings. A bypass return oil line to the reservoir prevents oil leakage. This hydraulic system is a complete package unit. Two 6-v

automotive type batteries in series are standard for powering the hydraulic system; one easily obtainable 12-v battery may be used, though. A built-in, compact unit charges the batteries. To charge these, the operator plugs in a cord to a 115-v circuit. Charging period is 8 hours. An ammeter shows the exact charge rate. It automatically shuts off when batteries are charged to proper levels. (Barrett-Cravens Co.)

For more data circle No. 43 on postcard, p. 113

Spring Steel

by SUPERIOR



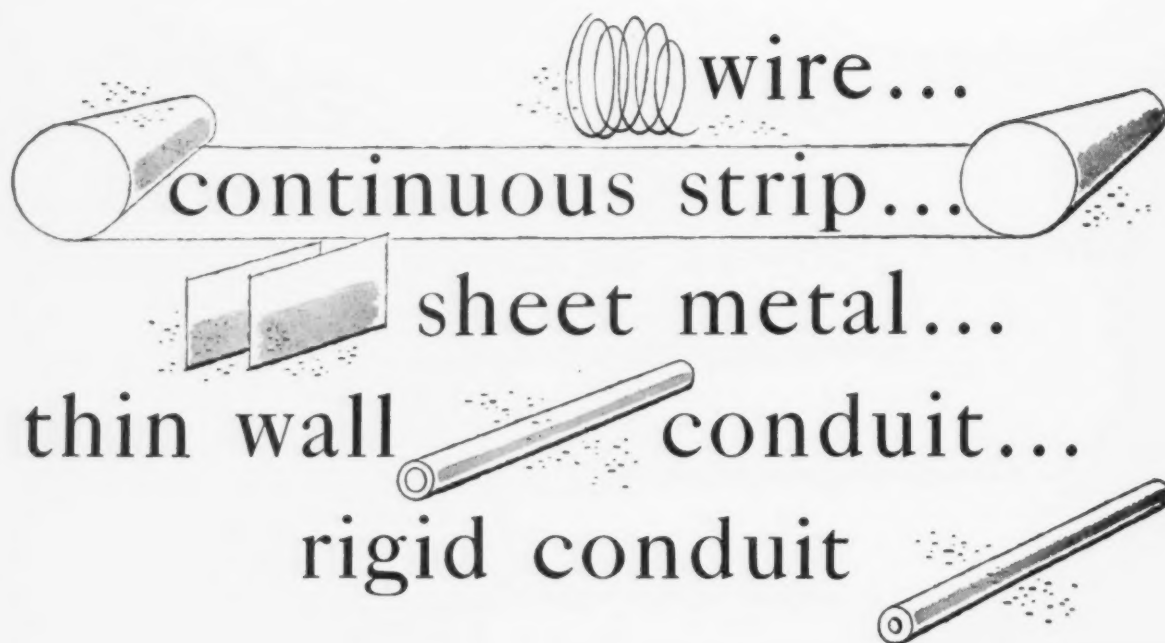
for the
uniform behavior
you require
in fabrication!
in service!

Uniform, dependable response to your manufacturing processes and subsequent service requirements is outstanding in SUPERIOR Spring Steel. We build uniform behavior into every coil, from specified analysis of composition to final anneal before shipment. We're strip steel specialists: *you gain by it.* Specify SUPERIOR for your spring steel needs!

Superior Steel

CORPORATION
CARNEGIE, PENNSYLVANIA

IF YOU PROCESS...



YOU CAN *Automate* ALL THESE OPERATIONS:

- cleaning
- pickling
- plating
- phosphating
- scrubbing
- paint prep
- electrogalvanizing

For Faster, Better Production . . . At Far Less Cost
with an
H-VW-M CONTINUOUS LINE SYSTEM

WRITE today, at no obligation, for the facts about an
H-VW-M System that can bring cost-saving *automation* to your
continuous line finishing—a system that can be integrated with
your shearing, forming, slitting or annealing operations.

**Hanson-Van Winkle-Munning Company, Matawan,
New Jersey Offices in principal cities.**



H-VW-M

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes • Equipment • Supplies

PLATEMANSHIP—Your H-VW-M combination—
of the most modern testing and develop-
ment laboratory—of over 80 years experi-
ence in every phase of plating and
polishing—of a complete equipment,
process and supply line for every need.

Quarter-inch steel plate is melted with an acetylene torch, but the supporting ALFRAX® BI brick stays cool enough to be held by hand.



Refractories...for really high temperature insulation

The problem of heat insulation at extreme temperatures is solved by two of Carborundum's refractories:

One is made of fused alumina "bubbles" or hollow spheres, bonded and high fired. These selected bubbles give proper balance between the number of surface temperature drops and total pore space (about 65% porosity) to effectively decrease heat flow between hot and cold faces. The alumina imparts high hot strength to the finished refractory, trade-marked ALFRAX BI. Under a load of 12½ psi and a temperature of 2732° F held for 1¾ hrs., less than 1% contraction occurred. No contraction whatever developed in 5 hour reheat tests at 3092° F. This combination of properties makes ALFRAX BI refractories unique in their ability to insulate at temperatures where other materials are impractical.

The other is FIBERFRAX® ceramic fiber, produced by blowing an alumina-silica fusion. Among its properties are high insulating values, light weight, resiliency, and corrosion resistance. All

are retained at 2300° F. In some cases, this fiber can be used successfully up to 3000° F. It is supplied in long and short staple, rope, board, paper, block, blanket, etc.

These products are but two of the many super refractories pioneered by Carborundum. Among them you are almost certain to find answers to your refractory and high-temperature problems. For help, fill in and mail this coupon today.

MAIL THIS COUPON TODAY

Refractories Division,
The Carborundum Company, Perth Amboy, N. J., Dept. B47

Please send me:

- ☐ Forthcoming issue of Refractories Magazine
- ☐ Bulletin on Properties of Carborundum's Super Refractories
- ☐ Here is a description of my high temperature problem. Can you help me?

Name _____ Title _____

Company _____

Street _____

City _____ Zone _____ State _____

CARBORUNDUM

Registered Trade Mark

To improve your product

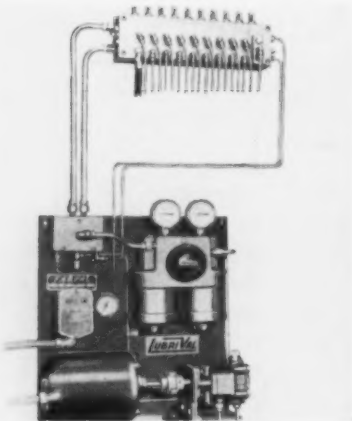


Counting Tubes Control Spot Welding Setups

A new three-phase control uses counting tubes for the control of spot welding operations. Another of its outstanding features is unitized construction. All timing, sequence and other individual functions are built as individual units. These are constructed on individual chassis of the sliding drawer type. A new positive lock plug makes all interconnections. These positive contact, cam-locked plugs are cable

mounted. This permits the control to operate with the units either locked in place or rolled out. It greatly aids maintenance because the tube operation of any unit is readily observed. The basic advantage, though, is the plug-in units' interchangeability. Cold cathode type counting tubes are used instead of RC networks to control all timing functions. (Weltronic Co.)

For more data circle No. 44 on postcard, p. 113



Lube System Circulates Oil For Machines

A new type circulating oil system lubricates presses, automatic and semi-automatic machine tools, etc. It employs a familiar two-line principle of operation to supply oil under pressure to measuring valves for delivery to bearing points. The valves have individual sight indicators and feature the positive piston displacement method of feeding lubricants. Two pilot models have been in operation on light and medium sized pieces in stamping plants

since last fall. The setup monitors its own operation to provide automatic, nearly foolproof operation. An alarm protects against clogged or broken lines in any part of the system. A variable delivery pumping unit permits wide selection in the number of "shots" per minute applied to bearing points of tools or machinery with which the system may be used as an automatic lubricator. (The Farval Corp.)

For more data circle No. 45 on postcard, p. 113

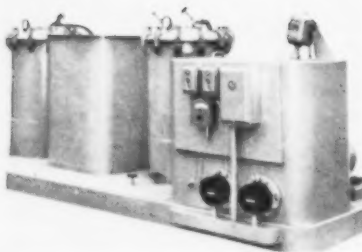


Automatic Ultrasonic Tester Gages Thicknesses

This ultrasonic tester automatically detects and records thickness changes in metals and other materials as small as 5/100 of one pct. It can hook up to an alarm, flash a signal light, or activate various compensating controls, if desired. High and low thickness tolerances can be established for tested items. These are automatically sorted into three categories: undersize, correct

size and oversize. The unit may also be set up to control machining processes, or to make corrective adjustments to compensate for machine errors which may be causing defective work to be produced. The automatic ultrasonic tester inspects thicknesses down to 0.005-in., also tests for proper bonding. (Branson Instruments, Inc.)

For more data circle No. 46 on postcard, p. 113



Casting Impregnator Improves Performance

This redesigned low-pressure vacuum casting impregnator eliminates sharp corners inside tanks. Sealants, thus, agitate without loss of solids into square corners. Exterior corners of the tanks and platform are also round for safe and neat appearance. With only two

water connections and one drain connection necessary, the impregnator uses a vented overflow system automatically insuring replacement of rinse water. It uses an almost noiseless watercooled vacuum pump. (Implex Div., Ideal Industries, Inc.)

For more data circle No. 47 on postcard, p. 113

To improve your product



AN EXAMPLE OF ALCHEMY

Transmutation of machine chips (background to foreground) from base steel to pure profit

The chips in the foreground aren't really gold — but they are the next best thing if you do extensive machining on circular forgings. They're Hi-Qua-Led Steel*. They are also the same grade steel as the chips in the background — 4140. You can see the great difference, but let us tell you something about it, too.

An initial production run in a customer's plant — using a Fellows gear shaper — produced both sets of chips. The regular 4140 steel forging had a Bhn of 285; the 41L40 Hi-Qua-Led Steel forging in the same grade had a Bhn of 285 to 293. Here are the results:

	4140 Steel	41L40 Hi-Qua-Led Steel
Roughing cut	50-60 sfm	80-85 sfm
	0.0145 feed	0.0176 feed
	0.530 depth of cut	0.533-0.538 depth of cut
Finish cut	50-60 sfm	100 sfm
	0.0145 feed	0.0176 feed
	0.033 depth of cut	0.025-0.030 depth of cut
State of finish	regular	super-finished
Total machining time	3½ hr average per gear (excluding down time for tool breakage)	2 hr average per gear (no tool breakage)

*Trade-mark registration pending. Patent applied for on lead-addition method.

Machining time saved: 1½ hours or 43 per cent per gear. The savings shown in this particular test are typical of Hi-Qua-Led's performance in many applications. Further, when you use Hi-Qua-Led circular forgings you do not sacrifice any regular steel quality. Hi-Qua-Led in any AISI grade has the same attributes as regular steel of the same grade.

Investigate the possibilities of Hi-Qua-Led Steel in circular forgings from 18- to 145-in. OD. ALCO specialists will visit your plant to help you save the most from its machining potentials. Contact your nearest ALCO sales office, or write Spring & Forge Division, Dept. OCF-3, P. O. Box 1065, Schenectady 1, N. Y. for brochures.



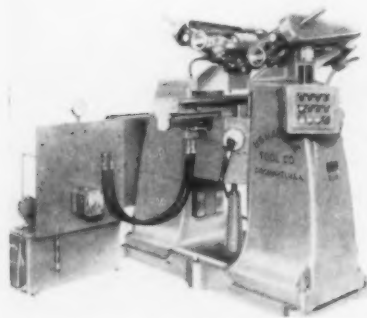
ALCO PRODUCTS, INC.

NEW YORK

Sales Offices in Principal Cities

Locomotives • Diesel Engines • Nuclear Reactors • Springs • Steel Pipe • Forgings • Oil-Field Equipment

Check FACTORIA'S Full Line of Radiant Heating Equipment



Double-column Hydraulic Miller Is Flexible

Many milling variations are possible with this rugged double-column hydraulic production milling machine. Using independent milling heads, it is very flexible. Unit construction permits mounting any type head in the required position for milling, drilling, grinding, boring, etc. Column tops are finish machined, approximately 12½-in.

square, providing adequate mounting surface for many head combinations. It has a 30-in. maximum table stroke; its knee has 15-in. vertical travel. Independent controls for table feed and head operation located in a panel separate from the machine. (U. S. Burke Machine Tool Div.).

For more data circle No. 48 on postcard, p. 113



POWER SPINNING of heads gives strength and rigidity to parts . . . keeps weight and bulk at a minimum.

ALL WELDED sheet steel construction provides the extra durability that means longer life . . . lower maintenance.



SPENCER Blowers

perform better because they're *made* better

Operation of any blower can only be as good as the workmanship that goes into making it.

That's why, step by step in the manufacture of SPENCER blowers—from the careful rolling of sheet steel to form casings . . . to the final painting with lead-base paint and then enamel—no effort is spared to produce the most reliable, sturdily constructed blowers on the market.

Spencer recognizes that there are no short cuts to quality. That's why SPENCER blowers have been preferred for forty years by leading furnace and other equipment manufacturers.

SPENCER

Blowers are available in these capacities:

H.P.—1/3 to 1,000
CFM—Up to 20,000
Pressure—4 oz. to 10 lbs.



Request Catalog 126-A containing complete specifications.



OTHER QUALITY
SPENCER PRODUCTS



STATIONARY
VACUUM
SYSTEMS



PORTABLE
VACUUM
CLEANERS



PNEUMATIC
CONVEYING
SYSTEMS

Sweeper Uses Magnet

Magnetic hand sweepers keep plant work areas and driveways free of tramp iron. Powered by non-electric Alnico V permanent magnets, the sweepers are mounted on semi-pneumatic ball bearing



wheels. They can be pushed by hand, towed behind a vehicle or, with the handle removed, suspended on built-in brackets from lift truck forks. The sweepers are available in a selection of sizes and magnetic strengths. Widths range from 18 to 60 in. Adjustable sweeping clearances from 1 to 2½ in. and sweeping speeds up to 10 mph are offered. (Magni-Power Co.)

For more data circle No. 49 on postcard, p. 113

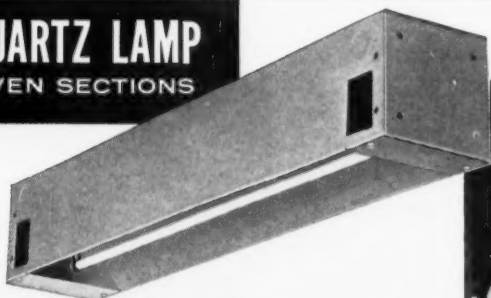
Unit Speeds Boring

Production of yokes for automotive universal joints is said to increase appreciably after installation of this two-way machine. The precision boring machine maintains a fast production schedule by permitting simultaneous operations at both ends of the part. Made of

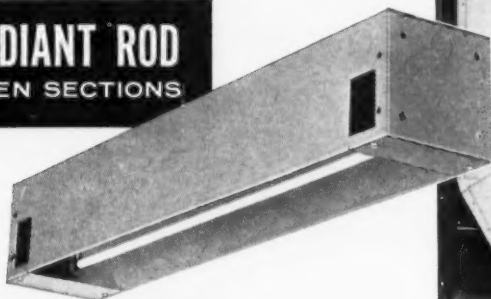
Check FOSTORIA'S Full Line of Radiant Heating Equipment...

Select Components or Complete Ovens from **3 SOURCES** OF INFRARED ENERGY

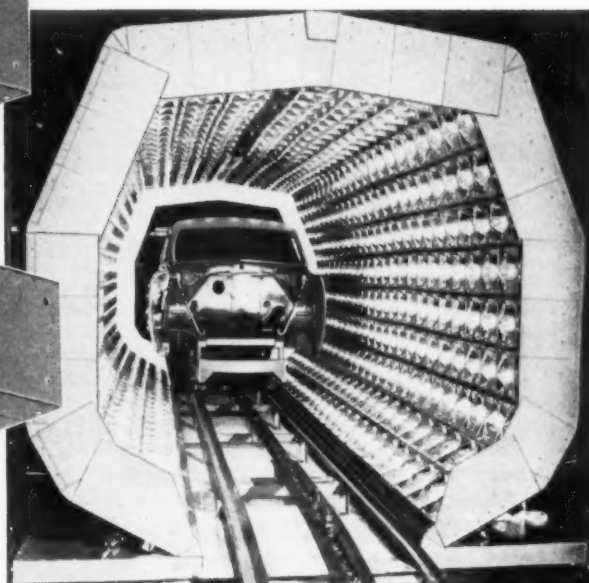
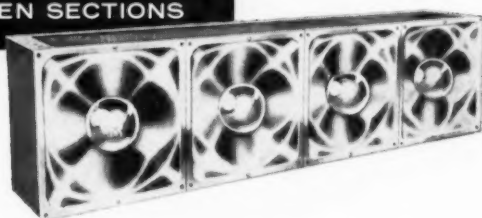
1 QUARTZ LAMP OVEN SECTIONS



2 RADIANT ROD OVEN SECTIONS



3 INFRARED LAMP OVEN SECTIONS



Fostoria Complete Radiant Ovens



Whatever the industrial application for radiant heat, FOSTORIA can recommend and supply the type of equipment best suited for the job. The FOSTORIA line includes equipment incorporating several sources: (1) The new T-3 quartz lamp (2) Far infrared metal elements, and (3) G-30 and R-40 near infrared lamps.

Because Fostoria manufactures a complete line

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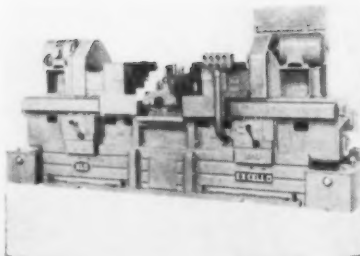
FOSTORIA PRESSED STEEL Corporation • Fostoria, Ohio
Pioneer Manufacturer of Radiant Equipment... Components to Complete Ovens

of sections, portable units and specially engineered ovens . . . of all three types, when you take your heating problem to Fostoria, you get an exclusive brand of heating "know-how," that is available only from Fostoria—the pioneer manufacturer of Radiant Heating Equipment. Get complete details on the FOSTORIA line today! See your nearby Fostoria Sales Engineer right away, or write direct.

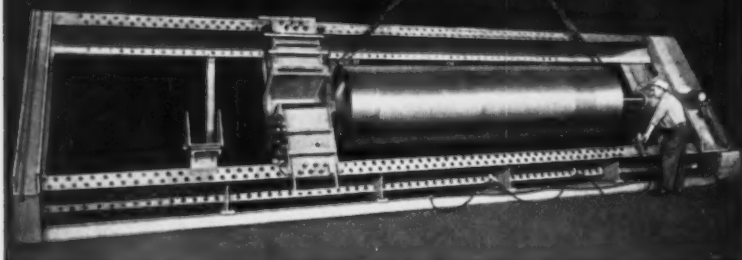
NEW EQUIPMENT

malleable iron, the universal joint yokes are fixture-clamped and two holes are finish bored in line. A three-station, hydraulically-operated fixture and three boring spindles on each slide of the machine produce three machined yokes in each automatic cycle. (Ex-Cell-O Corp.)

For more data circle No. 50 on postcard, p. 113



**When jobs are too big or heavy
for a conventional press...**



THE DAKE HORIZONTAL INCLINED PRESS is recommended for work on jobs that are so big or heavy that it is more convenient to do press work while they remain suspended from an overhead crane or hoist.

For instance in the illustration above, a 7-inch shaft is being pressed into the cable drum for a 200-ton overhead traveling crane. The drum is 17 feet long and 4 feet in diameter, and is supported on a crane hook.

This particular press (Model 32-100) is 33 feet long overall, and has a daylight opening of 25 feet. It has 300 tons capacity, a 60° inclined frame, 26-inch stroke, and a ram-to-table distance from 25 inches to 25 feet. The table is moved along the frame with a hand winch.

Dake Hydraulic Presses are engineered to meet such a variety of shop requirements that the engineering is probably almost done on the press you need. Let us quote.

DAKE CORPORATION, 602 Seventh St., Grand Haven, Mich.



**DAKE
PRESSES**

SEND TODAY FOR BULLETIN 330

DAKE CORPORATION
602 Seventh St., Grand Haven, Mich.

Please send me a copy of Dake Bulletin 330.

Name

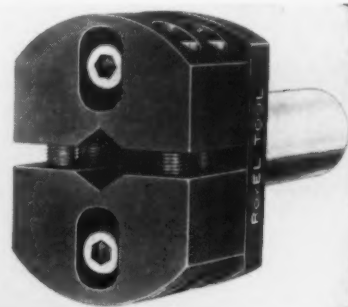
Company

Address

City Zone State

Holds Reamers, Drills

With a new 1½ inch capacity, a drill and reamer holder comes in three shank sizes: 1¼, 1½, and 1¾-in. Designed for use on multiple spindle automatics and turret lathes, the holders utilize a pair of

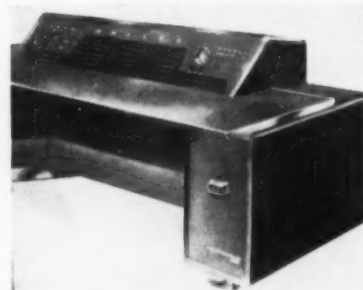


independently mounted sliding jaws. These provide 4-point holding for great strength. (RoyEl Tools).

For more data circle No. 51 on postcard, p. 113

Computer Is Compact

Wholly transistorized, this electronic computer for industrial and laboratory use is highly compact. With printed wiring throughout, the computer quickly solves long, compact mathematical problems. The transistors, unlike vacuum tubes, require no periodic replacement.

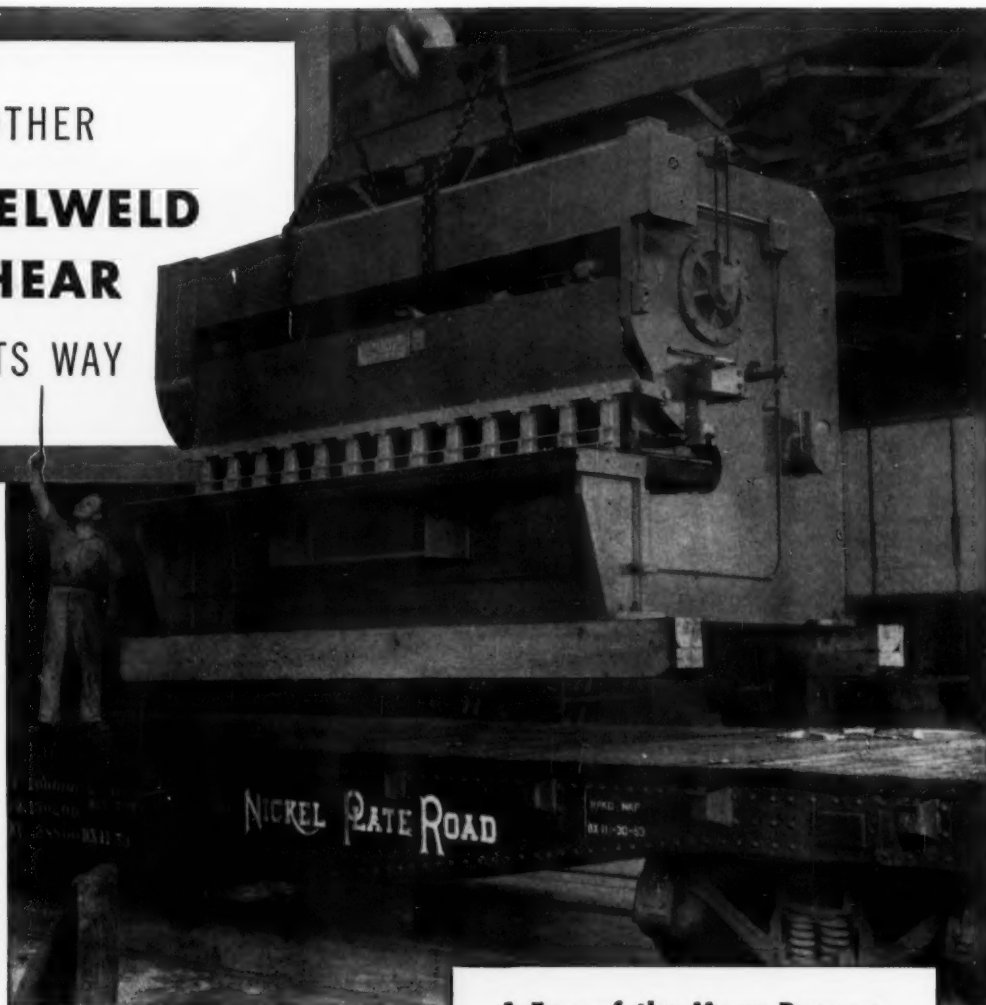


Its circuitry eliminates bulky insulation and heavy power supply equipment. Generating comparatively little heat, the unit needs only a small fraction of the air conditioning equipment sometimes required for large scale computers. It plugs into 110-v, 60 cycle outlets. Using casters, it is highly mobile. (Philco Corp.)

For more data circle No. 52 on postcard, p. 113

ANOTHER STEELWELD SHEAR ON ITS WAY

From every angle a Steelweld shear looks good — and is good. This machine is rated for 12'-0" x 1½" steel



SHIPMENTS are being made at a rapid rate to all parts of the country because more and more users are learning of the many merits of Steelweld Shears and are talking about them. As the words of experience spread about and comparisons are made, more and more people come to realize that Steelweld Shears are really outstanding.

For smooth, accurate burr-free cutting, Steelwelds can't be beat. For ease of operation they have no peer. Their heavy construction and means for simple, easy maintenance assure long trouble-free life.

For the finest in shearing, you can't make a better selection than Steelweld. Say the word and we'll have one of these wonderful machines on the way to you.

A Few of the Many Reasons For STEELWELD'S DEMAND

1. Pivoted-blade operation. Entirely different from every other shear. No slides or guides to wear and cause inaccuracies.
2. Micro-set knife adjustment. Quick easy knife-clearance adjustment for every plate thickness. Something not matched elsewhere. Be sure to get the complete story on this.
3. Mechanical hold-downs. Tight gripping, non-leaking, quiet operating.
4. Accurate easy operating back gauge rides on ball bearings.
5. Cool-operating, long-life, low-inertia clutch and brake.
6. Heavy all-welded rigid one-piece steel frame.

AVAILABLE FOR PLATE LENGTHS TO 24 FEET AND THICKNESSES TO 1½ INCH



GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

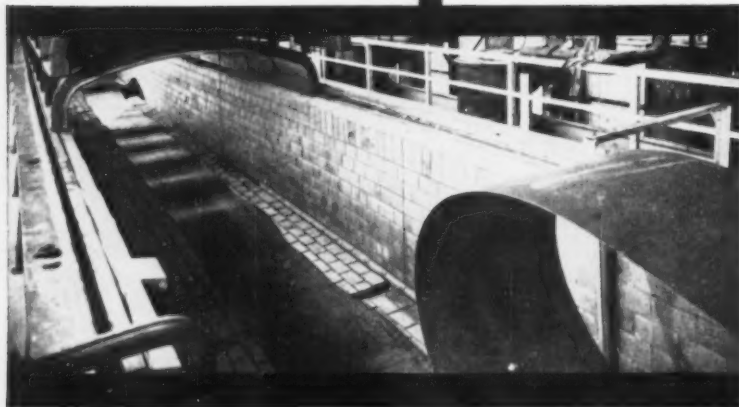
THE CLEVELAND CRANE & ENGINEERING CO.

4851 EAST 282 STREET, WICKLIFFE, OHIO

STEELWELD PIVOTED BLADE SHEARS

**your
corrosion
problems**

solved



**when you use
ATLAS materials
of construction**

More than any other, the name, ATLAS, is specified for corrosion proof materials of construction throughout the metal working industry.

In this industry, Atlas materials, engineering and design features have accounted for tremendous savings in maintenance and replacements.

In the last quarter century, thousands of tanks have been built of Atlas materials for use by the metal working industry . . . all types, from small dip tanks to the largest continuous picklers.

Let Atlas help you solve your corrosion problems with the most complete available line of corrosion proof materials of construction in the country.

Atlas provides a complete corrosion service from on-the-spot technical advice through engineering design to complete construction facilities to carry the job from beginning to end.

- CEMENTS
- COATINGS
- LININGS
- RIGID PLASTICS



Write for Bulletin CC23 giving informative data on the complete Atlas line.

NEW EQUIPMENT

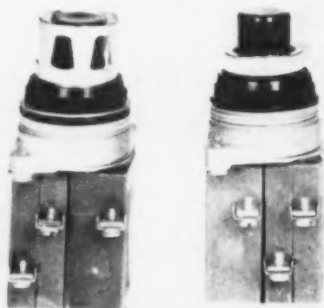
Solder Active at 150°F

Although soldering is usually done in the range of 360° to 500°F, it is necessary in certain types of work to use alloys with melting points ranging down to 150°F. For such applications an entirely new type of soldering paste does the job. This flux, free of chlorides and rosin compounds, is active at very low temperatures and has a long life. When used with conventional solders, the cleaning action will begin about 150°F and continue right up to the melting point of the regular solder. (American Solder & Flux Co.)

For more data circle No. 53 on postcard, p. 113

Button, Light Combine

An illuminated oiltight push button combines in one unit the functions of both a push button and an



indicating light. The device saves approximately 50-pct in panel control space. (General Electric Co.)

For more data circle No. 54 on postcard, p. 113

Gear Hobber 'Builds-up'

Using a common sub-base, new gear hobbing machines set up in "building block" fashion for tandem or unlimited series operation. Parts automatically feed through the base, divert to working machines, and automatically unload. Any number of machines can be cut in and out of production to meet requirements. Gear washers, classifiers and size-controls units can be integrated into the machine. (Michigan Tool Co.)

For more data circle No. 55 on postcard, p. 113



ZYGLO INSPECTS MISSILE RADOMES IN 2 MINUTES—Costly ceramoplastic parts for guided missiles are checked out for perfection in a minimum of time for one electronics manufacturer. When the telltale fluorescent indication shows up under "black light", inspectors know Zyglo has uncovered another defective component. In the case of the radomes, hundreds of dollars are saved by rejecting in the rough molded stage—before costly finishing operations are expended on parts destined for the scrap heap. Early detection also enables this manufacturer to correct processing errors before additional faulty parts are produced. Zyglo serves not only as an inspection tool, but as an "in-process" control check-point as well.



Y-5 PROVIDES "SECOND SIGHT" FOR INDUSTRY—For on-the-spot detection of crack-type defects in rough castings, we know of one company which puts low cost Magnaflux Y-5 Yoke Kits in the hands of their lathe operators. If a part is suspect, it can be quickly checked during "in-process" turning operations. This industrial "fore-sight" eliminates wasted time and effort on defective parts. Results: greater production economy and real product confidence.

HALLMARK
OF QUALITY IN
NONDESTRUCTIVE
TEST SYSTEMS



Write for complete details concerning any of the above case studies, (excerpts from MAGNAFACTS), or ask for our new booklet on Lower Manufacturing Costs.

THE IRON AGE, April 4, 1957

Case Studies: NONDESTRUCTIVE TESTING SYSTEMS



Checking a printed circuit base with a Magnaflux SO-100 Sonizon Unit

How "silent" sound spots invisible defects

Sonizon, another of the many Magnaflux developed nondestructive test systems, is currently being used to detect hitherto unmeasurable defects in many industrial products. This ultrasonic test instrument employs high frequency impulses to detect sub-surface discontinuities in metals, plastics, glass and other sound conductive materials.

Sonizon is lightweight, portable, easy to use. This remarkable ultrasonic instrument measures thicknesses from one side only and shows readings as a "pip" on the face of a TV-type tube as rapidly as a crystal probe is touched to the test materials. It is as easy to read as a ruler, and besides being far faster than a micrometer, Sonizon

provides the additional advantage of giving you a reliable way to make otherwise impossible readings on complex shapes.

Sonizon reduces inspection and production costs by instantly detecting such bothersome defects as: "thin walls" in cast, formed, welded or spun objects; laminar discontinuities; eccentricity in cored castings and cast iron pipe; and, lack of bond between materials used in "sandwich" construction.

If your production efforts are hampered by similar critical defects, it will pay you to investigate Sonizon today. Write for complete information, or request an interview with one of our experienced Magnaflux field engineers.



Sonizon is used in the automotive industry to detect lack of bond between valve lifter bodies and carbide wear plates.

Sonizon quickly and reliably detects any variance of taper dimensions in a machined cast magnesium cone.

Sonizon is used in aircraft maintenance to determine possible corrosion on the wing skin of planes, during regular major overhauls.

Take Your Inspection Problems to the House of Answers . . .
MAGNAFLUX CORPORATION

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New York 36 • Pittsburgh 36 • Cleveland 15 • Detroit 11 • Dallas 19 • Los Angeles 58

consider the profit angle



**... in salvaging and marketing
your sheet metal scrap!**

If your metal stamping or metal forming operations are generating sheet metal scrap in substantial volume — you have a disposal problem to solve.

In many plants the baling of sheet metal scrap has proved a highly profitable operation in the disposal process — resulting in such benefits as lower scrap handling costs, better use of floor space, increased production, higher average scrap prices.

Galland-Henning Hydraulic Baling Presses have been serving industry for many years in the low-cost salvaging of sheet metal scrap. If you are planning a new plant, the modernization or expansion of present facilities — the orderly baling of your sheet metal scrap is worth considering from the overall profit angle. Galland-Henning offers you competent counsel on this subject, without cost or obligation.

GALLAND-HENNING MFG. CO.

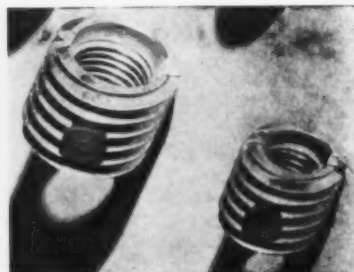
2725 S. 31st St., Milwaukee 46, Wisconsin

GALLAND-HENNING
SCRAP METAL BALING PRESSES

NEW EQUIPMENT

Inserts Get Smaller

Threaded inserts employing the nylon-pellet self-locking principle are now available as small as No. zero. These inserts eliminate need for special tools, tape or counter-



boring. They can be installed in a standard threaded hole and removed with a screw driver. (The Nylok Corp.)

For more data circle No. 56 on postcard, p. 113

Burns Air, Auto Fuel

With slight modification, a powerful free power turbine aircraft engine can adapt to industrial uses. Designed for ruggedness and maintenance ease, the engine has a low critical materials content. It has low fuel consumption, using automotive and aviation type gasolines or jet fuel. Utilizing the free power



turbine principle, the power turbine and its associated shafting and reduction gearing are mechanically independent of the compressor and its turbine. (Lycoming Div., Avco Mfg. Corp.)

For more data circle No. 57 on postcard, p. 113

Pads Reduce Noise

Compact machine mounting pads reduce machinery noise and vibra-

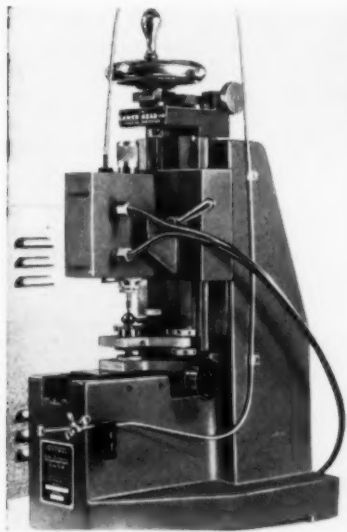
NEW EQUIPMENT

tion. Made of Geon resin, sisal, and granulated cork fused into an integrated pad, they resist water, oil, grease, most acids and alkalis. Pads are tough and yet flexible. Even after repeated loadings to 1000-psi, the pads recover 99 pct of original thickness. (Clark-Cutler-McDermott Co.)

For more data circle No. 58 on postcard, p. 113

Electronic Comparator

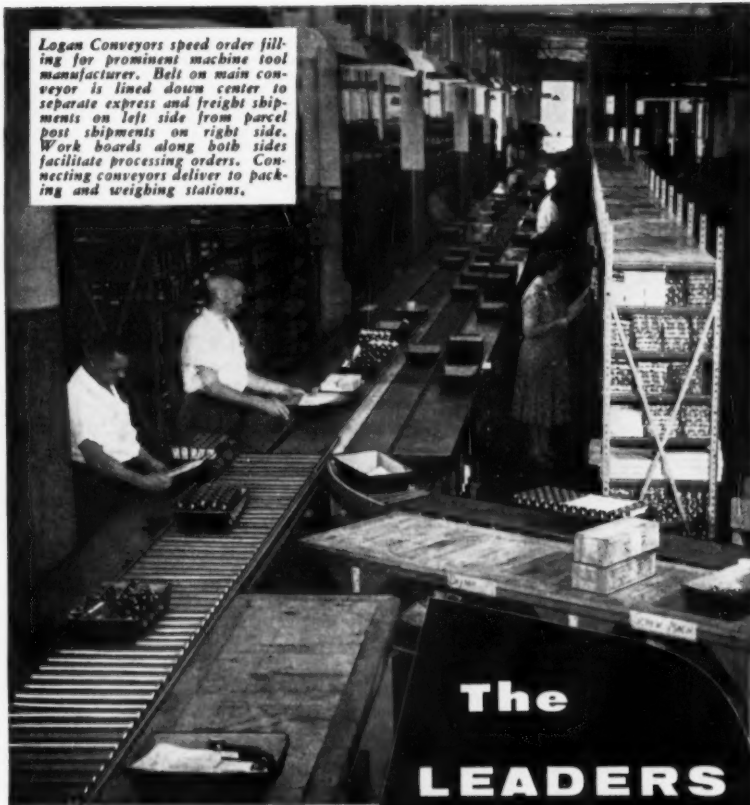
Dimensional variances as small as 0.000001-in. can be detected with this electronic comparator. Originally built to measure precision ball bearings, it is completely adjustable to various shapes and sizes. The gage consists of three parts: an electronic amplifier, an indicating meter and an electronic gage head. The latter mounts on a substantial base with an adjustable column. It permits vertical position-



ing of the gage head assembly. The gaging spindle mounts within the gage head on pantograph reed springs rather than in bushings to provide motionless transfer. This makes it very sensitive to the minutest variation in workpiece size. Any one of four magnifications can be selected. (Federal Products Corp.)

For more data circle No. 59 on postcard, p. 113

Logan Conveyors speed order filling for prominent machine tool manufacturer. Belt on main conveyor is lined down center to separate express and freight shipments on left side from parcel post shipments on right side. Work boards along both sides facilitate processing orders. Connecting conveyors deliver to packing and weighing stations.

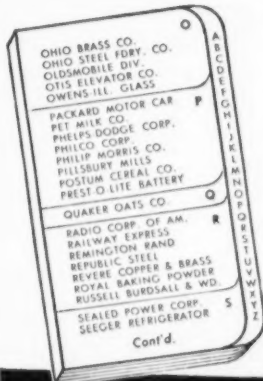


The
LEADERS
use
Logan



"If you can't lick 'em, jine 'em." Maybe that tough-to-beat competitor is using Logan material handling equipment! If you are not already a Logan Conveyor user, this is a cordial invitation to join the list of industrial leaders who employ this efficient aid to: Step up production tempo, increase capacity, speed deliveries, save manpower, decrease labor turnover. Write for further information or for nearest engineer to call.

LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.



Logan Conveyors

STEEL-MEN!



Corhart melting-end bridgewall, in tank described below, after 21 months and 6 days of service . . .

WHAT IS A "CORHART BALANCED FURNACE"?

THE term "Corhart Balanced Unit" does not signify a new or unusual design of glass furnace. It is used to describe *your* furnace, just as it stands, except with the more vulnerable parts fortified with Corhart Electrocast to that point where *all* parts of the tank—from dog-house to bottom—wear out evenly, each part delivering its full potential of life and service.

The cost of Corhart Electrocast is higher *per ton* of blocks, but analyses of cost and results in many units prove beyond question that it is by far the most economical refractory *per ton of glass produced*. Glass factory profits are determined by the cost of *finished ware* and NOT by the cost of the tank blocks. The following is a typical example of many actual records:

Cost, labor and materials	CORHART BALANCED TANK	CLAY TANK (AVE. OF 5 FIRES)
Life (days)	\$11,100.00	\$8,000.00
Tons of glass produced	648	289
Tank cost per day	22.087	7.274
Tank cost per ton of glass produced	\$17.12	\$27.70
Melting area	\$0.503	\$1.10
	18 x 32	18 x 32

With the outlook for large tonnage demand and the desirability of continuous operation, such economies as these can not long be ignored. Corhart Electrocast is the answer to the crying demand for a better glass furnace construction material. Write today for further information and proof of economy. Address: Corhart Refractories Co., Incorporated, 16th & Lee Sts., Louisville, Ky.

CORHART ELECTROCAST REFRACTORIES

HERE'S an ad of ours that appeared 24 years ago, back when only a few of the most progressive glass manufacturers would use Corhart Electrocast Refractory—"one of the world's highest-priced refractories". Today, however, Corhart Electrocast Refractories are used extensively throughout the world . . .

In 1957, Corhart 104 is still relatively new in the steel industry. It is also "one of the world's highest-priced refractories". Yet it offers open-hearth furnace operators the same opportunities for greater production and lower costs that Corhart Electrocast brought to glass manufacturers.

May we tell you the whole Corhart 104 story? Address: Corhart Refractories Co., Incorporated, 1638 West Lee Street, Louisville 10, Kentucky, U.S.A. SPring 8-4471.



CORHART 104 ELECTROCAST REFRACTORY

The words "Corhart" and "Electrocast" are registered Trade Marks which indicate manufacture by Corhart Refractories Company, Incorporated, Corhart Refractories Co., Incorporated, 1602 West Lee Street, Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471

The Iron Age Summary

Steel Brokers Running to Cover

Increased output of plates and structurals making it tough for premium-price crowd.

Mills are looking for export tonnage to help take up expected summer slack.

■ The changing steel market is forcing some part-time steel brokers to run for cover. Increased mill production of light plate is pulling the rug from under speculators who charge what the traffic will bear.

Plate is still a market strong point. But heavy tonnages of light gage material have been rolling off sheet-strip mills. This is competing with premium-priced broker material. And hard-pressed users are in a better position to dicker with the speculators.

Structurals, Too—There are signs also that the premium-price market in structurals is not so tough as it once was. Some brokers of structural shapes are becoming easier to

deal with. Contributing to this slightly easier tone is the increasing structural output of a mill that normally emphasizes flat-rolled.

Still, the structural market continues so tight that most users are limited to a monthly quota from the mills. And they're happy to take what they can get. Orders are booked months in advance.

Far West Windfall—Meanwhile, more eastern-produced steel is finding its way to the West Coast. Western buyers are paying a premium for it because of the extra freight, but the windfall is easing the tight situation in that steel-hungry section of the country.

Many steelmakers are quietly looking for export tonnages to take up some of the slack this summer. Unfortunately most of the demand from abroad is for the same items which are short at home—plate, structurals, and pipe.

Backlogs Steady—Supporting expectations that overall steel ship-

ments this year will be on a par with those of 1956 is the fact that order backlogs this week are little changed from a month ago. This despite the sharp drop in sheet and strip order volume.

Part of the decline in steel ingot output is due to the change in product mix. When a much larger percentage of finished steel falls in the light plate, structural, pipe, and heavy plate categories—less steel is produced per hour of mill time. That draws less steel from the open-hearths. To put it simply—it takes longer to make the heavier steel products.

Sheets Dull—Most sheet mills have not noticed any improvement in sheet sales for April shipment—and there is some question on May. But these same mills have booked heavy tonnages of light plate and other sheet products. So that sheet mill order books are not too far behind in total flat-rolled tonnage booked.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,368	2,368	2,420*	2,449
Ingot Index (1947-1949=100)	147.4	147.4	150.6	152.5
Operating Rates				
Chicago	88.0	87.0*	93.0	99.0
Pittsburgh	94.0	93.0*	98.0	101.0
Philadelphia	105.0	105.0	103.0	101.0
Valley	80.0	88.0*	91.0	99.0
West	101.0	102.0	100.0	101.0
Buffalo	93.0	95.0	95.0	105.0
Cleveland	91.0	94.0*	91.0	102.0
Detroit	99.0	99.0	103.0	82.0
S. Ohio River	70.0	71.0*	84.0	88.0
South	97.0	99.0	95.5	93.0
Upper Ohio R.	92.0	78.0*	101.0	102.0
St. Louis	101.0	99.0	95.5	95.0
Northeast	66.0	66.0	76.0	92.0
Aggregate	92.5	92.5	94.5	99.5

*Revised—NOTE: Correct "Month Ago" production issue 3-28-57 is 2,458.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.670	5.670	5.670	5.179
Pig Iron (Gross Ton)	\$64.56	\$64.56	\$64.00	\$60.29
Scrap, No. 1 hvy (Gross ton)	\$44.17	\$45.83	\$50.50	\$53.67
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	25.90
Copper Electrolytic	32.00	32.00	32.00	46.00
Lead, St. Louis	15.80	15.80	15.80	15.80
Lead, St. Louis	15.80	15.80	15.80	15.80
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin, Straits, N. Y.	98.875	102.00	99.00	100.375
Zinc, E. St. Louis	13.50	13.50	13.50	13.50

*Revised

Bar Producers Face Stormy Weather

Bar — regarded by many as an accurate market barometer — is currently in trouble.

Spring upsurge is urgently needed to pull the product out of the doldrums.

■ The bar market—often considered a good economic weathervane—is currently indicating stormy going. There's hope, however, that it's a temporary squall.

At the moment some mills still have both hot-rolled and cold-finished bar for shipment this month. In one area stainless and alloy bar facilities are being turned over to carbon bar production. Most grades of cold-finished bar can be obtained on four-week delivery even where special treatment has been specified by the customer.

West is Exception—Only in one market area, the West Coast, is bar strong. There heavy demand is being met, in part, by shipments from the east.

Despite the general market slackness, the mills are predicting an upsurge in May and June. They're banking on increased consumption by the automakers, a general pickup in buying and some inventory building to beat the expected July increase in price.

Sheet and Strip — This month seems likely to mark low tide in flat-rolled ordering, with a pickup due in May.

While **Detroit** area mills are slowing operations, they feel a spurt would result if the automakers should reinstate any of these cuts in production schedules. And

meanwhile there's still a fair flurry of sheet orders as customers fill holes in inventories.

Flat-rolled capacity is booked at levels of 80 pct or better for April at **Cleveland**. Tonnage normally taken for cold-rolled sheet is going into hot-rolled sheet and light plate.

Market continues weak at **Philadelphia** with consumers being offered out-of-the-area supplies. Mills report some rush orders from customers with depleted inventories.

Most mills in **Chicago** area are still looking for April orders in cold-rolled. Hot-rolled mills are doing better, but largely because of light plate rolling.

Bar—Market is somewhat weak, but here also a pickup is expected.

Both hot-rolled and cold finished bar is available for April shipment at **Chicago**. Most grades of cold finished can be obtained on four-week delivery even where special treatment has been specified by the customer.

Market is slow at **Detroit** with general feeling that automakers and vendors are loaded on all types of bars.

A large producer at **Philadelphia** reports some customers are buying

PURCHASING AGENTS' CHECKLIST

Oil country goods are seen as easing slowly. **P. 54**

What power expansion means to equipment suppliers. **P. 58**

Lower prices, less metal is prospect for consumers as government begins eliminating stockpiling. **P. 60**

fairly strongly, others are slacking off.

West Coast buyers are enjoying a windfall as bigger shipments come in from the Eastern mills.

Shapes and Plates — These are products contributing much strength to the current market.

Some product saturation at **Chicago** has caused brokers to unload light gage or narrow width structural and plate. Mill competition proved too stiff. While wide plate and wide flange structurals are still tight, this latest development has some buyers holding off to see if they can't get lighter or narrower products at better prices.

Same situation exists at **Detroit** with light plate easing. Demand for heavier product remains strong.

Philadelphia area plate mills continue supplying users on a monthly or quarterly allocation basis.

Purchasing agents for **West Coast** fabricators report it's fairly easy to get plate in sizes up to $\frac{3}{8}$ in. Large tonnage is moving into the market from the east. Coast warehouses are paying a premium to get eastern strip mill plate in the 3/16 in. through $\frac{1}{2}$ in. range.

Tinplate — Product, particularly the coiled variety, continues to move strongly at **Chicago**. Galvanized which had shown some booking improvement seems to be losing steam. Pickup expected from farm market hasn't materialized to great extent. Tinplate production in the **Cleveland** area is at capacity with consumers interested in getting product before prices go up April 30.

Wire Products—Market, despite scattered reports of improved merchant wire business, is still not strong. A sharp pickup in housing starts is helping the **Chicago** market somewhat. At **Cleveland** some specialties require 4-6 weeks for delivery, but wire products in general are available in about 10 days to 2 weeks. Manufacturers wire can be obtained in about 2-3 weeks; merchant products such as nails, bailing wire, and fencing almost off the shelf.

COMPARISON OF PRICES

(Effective April 2, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	April 2 1957	Mar. 26 1957	Mar. 5 1957	April 3 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.28
Plate, wrought iron	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	10.40
Stain's C-R strip (No. 302)	50.00	50.00	50.00	44.50

Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.95	\$9.95	\$9.95	\$9.05
Tin plates, electro (0.50 lb.)	8.65	8.65	8.65	7.75
Special coated mfg. ternes	9.20	9.20	9.20	7.85

Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	43.25	43.25	43.25	38.25
Wrought iron bars	11.50	11.50	11.50	11.50

Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.60¢

Rails: (per 100 lb.)				
Heavy rails	\$5.275	\$5.275	\$5.275	\$4.725
Light rails	6.25	6.25	6.25	5.65

Semifinished Steel: (per net ton)				
Revolving billets	\$74.00	\$74.00	\$74.00	\$68.50
Slabs, reolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00

Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.225	4.225	4.225	4.225

Finished Steel Composite: (per pound)				
Base price	5.670¢	5.670¢	5.670¢	5.179¢

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite
Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	April 2 1957	Mar. 26 1957	Mar. 5 1957	April 3 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$68.88	\$68.88	\$66.88	\$65.26
Foundry, Valley	65.00	65.00	63.00	60.60
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	65.00	65.00	65.00	60.50
Basic, del'd Philadelphia	68.38	68.38	66.38	64.48
Basic, Valley furnace	64.50	64.50	62.50	60.00
Malleable, Chicago	65.00	65.00	65.00	60.50
Malleable, Valley	65.00	65.00	63.00	60.50
Ferromanganese, cents per lb	12.75¢	12.75¢	12.75¢	9.50¢
74 to 76 pct Mn base.				

Pig Iron Composite: (per gross ton)	\$64.56	\$64.56	\$64.00	\$60.29
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Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$12.50	\$44.50	\$50.50	\$55.50
No. 1 steel, Phila. area	19.50	50.50	55.50	63.00
No. 1 steel, Chicago	10.50	42.50	45.50	52.50
No. 1 bundles, Detroit	31.50	40.50	42.50	52.50
Low phos., Youngstown	11.50	45.50	50.50	59.50
No. 1 mach'y cast, Pittsburgh	49.50	50.50	56.50	58.50
No. 1 mach'y cast, Philadel'a.	55.50	55.50	57.50	55.50
No. 1 mach'y cast, Chicago	45.50	47.50	49.50	56.50

Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$44.77	\$45.83	\$50.50	\$53.67

Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$15.38	\$15.38	\$16.38	\$14.50
Foundry coke, prompt	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19	\$17.50

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	32.00	32.00	32.00	46.00
Copper, Lake, Conn.	32.00	32.00	32.00	43.00
Tin, Straits, New York	98.875¢	102.00	99.00	100.375
Zinc, East St. Louis	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80
Aluminum, virgin ingot	27.10	27.10	27.10	25.90
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	33.35
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

→ To identify producers, see Key on P. 156 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. B6	66.50	67.00	67.50	68.00	
Birmingham R3	58.50	59.00*			
Birmingham W9	58.50	59.00*	63.00		
Birmingham U4	58.50	59.00*	63.00		
Buffalo R3	64.50	65.00	65.50	66.00	
Buffalo H1	64.50	65.00	65.50	66.00	
Buffalo W6	64.50	65.00	65.50	66.00	
Chester P2	64.50	67.00	67.50		
Chicago J4	64.50	65.00	65.00	65.50	
Cleveland A5	64.50	65.00	65.00	65.50	69.50†
Cleveland R3	64.50	65.00	65.00	65.50	
Duluth J4	64.50	65.00	65.00	65.50	69.50†
Erie J4	64.50	65.00	65.00	65.50	69.50†
Everett M6	66.50	67.00	67.50		
Fentona K1	70.50	71.00			
Geneva, Utah C7	64.50	65.00			
Granite City G2	66.40	66.90	67.40		
Hubbard Y1			65.00		
Ironton, Utah C7	64.50	65.00			
Midland C11	64.50				
Minnequa C6	66.50	67.00	67.50	68.00	
Monessen P6	64.50				
Neville Ia. P4	64.50	65.00	65.00	65.50	69.50†
N. Tonawanda T1	64.50	65.00	65.00	65.50	
Sharpville S3	64.50	65.00	65.00	65.50	
So. Chicago R3	64.50	65.00	65.00		
Swedeland A2	66.50	67.00	67.50	68.00	
Toledo J4	64.50	65.00	65.00	65.50	
Troy, N. Y. R3	66.50	67.00	67.50	68.00	72.50
Youngstown Y1			65.00	65.50	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. * Add \$1.00 for 0.31-0.69 pct phos. † Intermediate low phos. ‡ Add \$1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo, H1, \$78.50; Jackson, J1, J4 (Globe Div.), \$77.25; Niagara Falls (15.01-15.50), \$39.50; Kookuk (14.01-14.50), \$110.00; (15.51-16.00), \$105.00. Add \$1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add \$1.00 for each 6.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under 10 pct phos.): \$64.00. Add \$1.00 premium for all grades silvery 6 pct to 14 pct.

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, reroll.	21.25	22.75	22.25	24.25	—	26.00	38.25	31.00	35.50	—	16.00	27.75	16.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	—	20.75	—	21.00
Billets, forging	—	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	30.75	27.25	27.75	27.75
Bars, struct.	40.50	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	42.50	43.25	44.50	45.50	48.00	48.75	73.75	57.50	67.00	38.75	33.75	35.50	34.50
Sheets	46.75	47.25	49.25	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	44.50	39.25
Strip, hot-rolled	34.50	37.50	35.75	39.00	—	42.50	66.50	51.50	61.00	—	29.75	—	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	44.50	39.25
Wire CF; Rod HR	—	39.25	40.25-40.50	41.00-41.25	44.00	43.75	66.75-67.00	50.50-51.00	59.25-59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J1; Baltimore, Md., E1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, Ind., J4; Philadelphia, D5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Harrison, N. J., D3; Youngstown, Pa., C3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1; New Bedford, Mass. (.25¢ per lb higher), R6; Gary, Ind. (.25¢ per lb higher).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, Ill.; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ind., A5; Canton, O., T3; Ft. Wayne, Ind., J4; Philadelphia, D5; Detroit, R3; Gary, Ind.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, Pa.; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, Ill.

Plates: Brackenridge, Pa., A3; Chicago, Ill., U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Philadelphia, D5; Vandergrift, Pa., U1; Gary, Ind.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, Ill.; Syracuse, C11; Detroit, R3; Munhall, Pa., S. Chicago, Ill.

Export Goes Inland For Low Prices

Big spread between East and Midwest lures export to Chicago docks.

But general market decline continues in most areas.

■ Tonnages of scrap are building up on Chicago docks for export to Europe. At least one order of 20,000 tons has been confirmed.

Buildup on the docks of Lakes ports is not unusual at this time of the year. But generally it is headed for Buffalo or other Lakes cities, or even Hamilton, Ont.

Unprecedented export from Chicago to Europe is undoubtedly caused by the wide spread between inland prices and Coast ports. Chicago price this week is \$41 top, compared with \$50 in Philadelphia.

Extent of this movement will be watched closely, particularly on the East Coast where export has pegged the market well above levels in inland areas.

The export activity in Chicago has not bolstered the market but it may account for the lack of No. 1 heavy melting in dealer yards.

In general, the market decline continues. All major markets in the Midwest and Pittsburgh showed serious declines, ranging from \$1 to \$6 for both No. 1 and No. 2 grades.

Pittsburgh—Prices of most grades fell \$1 to \$2 as major mills continue to avoid large purchases. A small tonnage of No. 2 heavy melting and of No. 2 bundles was ordered by one mill at prices \$1 under previous buys. Brokers are dropping their prices for machine

shop turnings to \$30 and say this is high. Railroad grades have weakened a little, but there is no activity to peg the exact level.

Chicago—Prices slipped another \$2 to \$3 as mills continue to accept small quantities of scrap at reduced prices. There is a definite buildup of scrap stocks for export out of Chicago when the Lakes open. At least one order of 20,000 tons was confirmed, slated for European shipment. This helps, in part, explain the low quantity of scrap in dealer yards, despite the slow demand for scrap for local mills.

Philadelphia — Blast furnace grades led a general price drop in this market with purchases at \$3 to \$6 under last week's levels. Small buys of steelmaking grades were reported at \$49-\$50, a drop of \$1. However, revived export and a healthy mill operating rate created an undercurrent of optimism in the trade.

New York—The market continues to fall. Steelmaking grades are down \$2 and turnings about \$4. Cast is off \$1 to \$2. Smallish April buying by a major mill in adjacent consuming area has not boosted price structure. Some dealers say prices would be even lower if not for continuing export business.

Detroit—The market nosedived this week following the closing of April automotive lists. Brokers are in no hurry to buy dealer scrap. Local mills are content with industrial grades at this time. Prices fell as much as \$6 on some grades here.

Cleveland—Dealer scrap dropped another \$4 and some tonnage is going to end up as foundry scrap. End of the decline is not in sight. Local auto lists which went to a single broker will probably go out of the district because of the weak market. Some went to a fringe mill for \$48. Dealer material was sold in the same area for \$45 last week and shipment held up this week.

St. Louis—A leading mill in the district has reduced its prices from \$1 to \$2. Other mills are shying away from buying at this time. Some items are down \$3 to \$5. The market is generally in a depressed state, in spite of the high operating rate of 101 pct.

Birmingham — An Atlanta mill has issued cancellation orders on all contracts for No. 2 heavy melting, but brokers anticipate it will buy again at around \$3 under last purchases. They have cut their own buying prices accordingly. Electric furnace and cast markets continue weak.

Cincinnati—Largest area mill all but pulled out of the market with April prices at \$40 delivered for No. 1 heavy melting. This is \$8 under a month ago and \$4 under last week's prices. Only a few dealers are getting orders.

Buffalo—A sale of No. 2 grades was made this week at quoted prices. Buys of No. 1 grades are expected later this week. Cast grades are off \$1 to \$2. A mill strike continues here and a major mill has shut down one openhearth.

Boston—Prices are down \$3 to \$4 all along the list. There have been a few small sales of steelmaking grades, but there is no market for cast.

West Coast—Prices broke in San Francisco, Los Angeles and Seattle. Some top grades dropped as much as \$4 per ton. Mills are operating at capacity, but buying only to meet needs. Export is still good.

make a Missile out of a Muzzle-Loader?

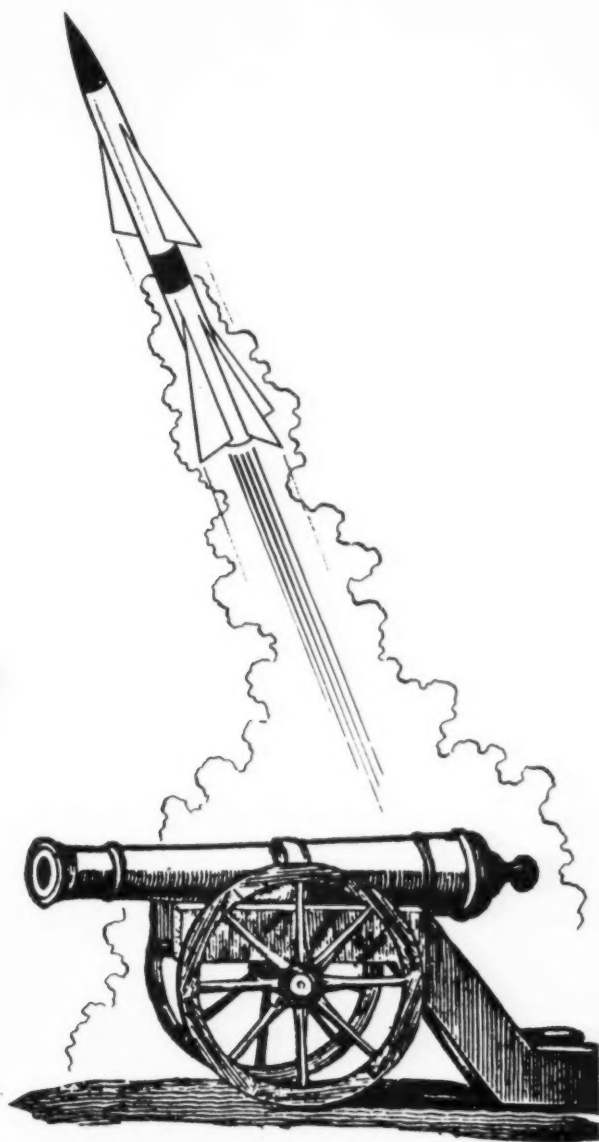
There's a century . . . and a million miles of technological improvement . . . between the muzzle-loading cannon and today's weapons.

But the muzzle-loader could be a part of the missile. The nation's scrap iron and steel industry constantly gathers and processes obsolete materials for re-melting into the steels of today.

This process helps conserve one of our country's vital resources. And it results in

better steels, too, for scrap, unlike ore, is pre-refined. And it requires less time in the melt because it is graded for the steel analysis in which it is used.

This constant re-creation of out-moded products is a fascinating business — one we've been part of for forty years.



THE LUNTZ IRON & STEEL COMPANY

OFFICES: Canton, Ohio; Cleveland, Ohio; Warren, Ohio; Kokomo, Indiana; Detroit, Michigan; Pittsburgh, Pa.
PLANTS: Canton, Ohio; Cleveland, Ohio; Warren, Ohio; Kokomo, Indiana.

SCRAP PRICES (Effective April 2, 1957)

Pittsburgh

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	42.00 to 43.00
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	33.00 to 34.00
Low phos. punch's plate	47.00 to 48.00
Heavy turnings	37.00 to 38.00
No. 1 RR. hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	61.00 to 62.00
Rails 2 ft and under	63.00 to 64.00
RR. steel wheels	61.00 to 62.00
RR. spring steel	61.00 to 62.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00

Chicago

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. forge crops	54.00 to 55.00
Low phos. punch's plate	48.00 to 49.00
Low phos. 3 ft and under	47.00 to 48.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	53.00 to 54.00
Rerolling rails	57.00 to 58.00
Rails 2 ft and under	56.00 to 57.00
Locomotive tires cut	51.00 to 52.00
Cut bolsters & side frames	49.00 to 50.00
Angles and splice bars	54.00 to 55.00
RR. steel car axles	70.00 to 71.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoe	29.00 to 30.00
Cast iron wheels	47.00 to 48.00
Malleable	55.00 to 56.00
Stove plate	39.00 to 40.00
Steel car wheels	51.00 to 52.00

Philadelphia Area

No. 1 hvy. melting	\$49.00 to \$50.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	49.00 to 50.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	49.00 to 50.00
Machine shop turn.	35.00 to 36.00
Mixed bor. and turn.	36.00 to 37.00
Cast iron borings	42.00 to 43.00
Shoveling turnings	41.00 to 42.00
Clean cast chem. borings	41.00 to 42.00
Low phos. 5 ft and under	54.00 to 55.00
Low phos. 2 ft and under	55.00 to 56.00
Low phos. punch's	55.00 to 56.00
Elec. furnace bundles	51.00 to 52.00
Heavy turnings	45.00 to 46.00
RR. steel wheels	59.00 to 60.00
RR. spring steel	59.00 to 60.00
Rails 18 in. and under	68.00 to 69.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	55.00 to 56.00
Cast iron car wheels	61.00 to 62.00
Malleable	63.00 to 64.00
Unstripped motor blocks	37.00 to 38.00
No. 1 machinery cast.	55.00 to 56.00

Cleveland

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	44.50 to 45.50
No. 2 bundles	30.00 to 31.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	27.50 to 28.50
Shoveling turnings	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Cut struct'l & plates, 2 ft & under	49.00 to 50.00
Drop forge flashings	37.00 to 38.00
Low phos. punch's, plate	38.00 to 39.00
Pounding steel, 2 ft & under	44.00 to 45.00
No. 1 RR. heavy melting	44.00 to 45.00
Rails 2 ft and under	66.00 to 67.00
Rails 18 in. and under	67.00 to 68.00
Railroad grade bars	32.00 to 33.00
Steel axle turnings	30.00 to 31.00
Railroad cast.	53.00 to 54.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	54.00 to 55.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	41.00 to 42.00

Buffalo

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 busheling	43.00 to 44.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	34.00 to 35.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	28.00 to 29.00
Low phos. plate	48.00 to 49.00
Scrap rails, random lgth.	58.00 to 59.00
Rails 2 ft and under	62.00 to 63.00
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. punch's, plate	34.00 to 35.00
No. 1 cupola cast.	46.00 to 47.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast.	54.00 to 55.00

St. Louis

No. 1 hvy. melting	\$42.00 to \$44.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	34.00 to 35.00
Machine shop turn.	28.00 to 29.00
Cast iron borings	30.00 to 31.00
Shoveling turnings	30.00 to 31.00
No. 1 RR. hvy. melting	46.00 to 47.00
Rails, random lengths	51.00 to 52.00
Rails 18 in. and under	58.00 to 59.00
Locomotive tires uncut	50.00 to 51.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	70.00 to 71.00
RR. specialties	50.00 to 51.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	40.00 to 41.00
Cast iron brake shoes	41.00 to 42.00
Stove plate	38.50 to 39.50
Cast iron car wheels	44.00 to 45.00
Rerolling rails	59.00 to 60.00
Unstripped motor blocks	26.00 to 27.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	37.00 to 38.00
Elec. furnace, 3 ft & under	41.00 to 42.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and short turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Clean cast. chem. borings	30.00 to 31.00
No. 1 machinery cast.	40.00 to 45.00
Mixed cupola cast.	36.00 to 37.00
Heavy breakable cast.	43.00 to 44.00
Stove plate	33.00 to 34.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	40.00 to 41.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Clean cast. chem. borings	31.00 to 32.00
No. 1 machinery cast.	45.00 to 46.00
Mixed yard cast.	30.00 to 31.00
Charging box cast.	45.00 to 46.00
Heavy breakable cast.	45.00 to 46.00
Unstripped motor blocks	32.00 to 33.00

Birmingham

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	31.00 to 32.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	46.00 to 47.00
Bar crops and plate	49.00 to 50.00
Structural and plate, 3 ft.	48.00 to 49.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	45.00 to 46.00
Rails 18 in. and under	53.00 to 54.00
Angles & splice bars	52.00 to 53.00
Rerolling rails	58.00 to 59.00
No. 1 cupola cast.	48.00 to 49.00
Stove plate	47.00 to 48.00
Charging box cast.	37.00 to 38.00
Cast iron car wheels	37.00 to 38.00
Unstripped motor blocks	38.00 to 39.00
Mashed tin cans	15.00 to 16.00
Elec. furnace, 2 ft & under	44.00 to 45.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. & under	48.00 to 49.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	63.00 to 64.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	41.00 to 42.00
Drop broken cast.	55.00 to 56.00

San Francisco

No. 1 hvy. melting	\$51.00
No. 2 hvy. melting	\$46.00 to 48.00
No. 1 dealer bundles	50.00
No. 2 bundles	38.00 to 40.00
Machine shop turn.	35.00
Cast iron borings	33.00 to 35.00
No. 1 RR. hvy. melting	51.00
No. 1 cupola cast.	57.00

Los Angeles

No. 1 hvy. melting	\$51.00
No. 2 hvy. melting	\$46.00 to 48.00
No. 1 dealer bundles	50.00
No. 2 bundles	36.00 to 38.00
Machine shop turn.	33.00 to 35.00
Shoveling turnings	37.00
Cast iron borings	34.00
Elec. turn. 1 ft. and under (foundry)	62.00
No. 1 RR. hvy. melting	51.00
No. 1 cupola cast.	54.00 to 56.00

Seattle

No. 1 hvy. melting	\$51.00
No. 2 hvy. melting	45.00
No. 2 bundles	\$30.00 to 32.00
No. 1 cupola cast.	54.00
Mixed yard cast.	54.00

Hamilton Ont.

No. 1 hvy. melting	\$48.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	48.00
No. 2 bundles	37.00
Mixed steel scrap	40.00
Busheling	34.00
Bush, new fact., prep'd.	46.00
Bush, new fact., unprep'd	42.00
Machine shop turn.	27.00
Short steel turn.	33.00
Mixed bor. and turn.	24.00
Rails, rerolling	54.00
Cast scrap	50.00

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More Buyers Enter Copper Market

Kennecott's Chilean operation closed by walkout.

British price is up despite crippling strike.

Confused situation, steady producers' price driving users back into the market.

■ The world copper situation is confused by world-wide strikes.

Custom smelter copper is strong at 30.75¢ to 31¢ per lb.

Producers' copper has held at 32¢ per lb for over one month and a half.

This combination is driving a lot of reluctant consumers back into the market. The sales manager of a major independent brass mill says orders in March more than double February. This, he continues, will be reflected in heavier copper buying by his mill.

Follows The Trend—The erratic world situation seems to be the clincher. After producers had held the 32¢ line for one month, the ranks of the pessimists began to thin. When the custom smelter price faltered to 30.5¢, then immediately recovered, even more purchasing agents decided the weak copper market had hit at least a temporary low.

The latest: (1) The London market is strong despite the fact that British industry is crippled by a strike of over 2.4 million workers, and more expected. (2) Braden Copper Co., Chile, is closed by a strike. (3) Talk of work stoppages in African and Canadian mines continues.

Those who still think the copper price is destined to drop any day now are few and far between. And some of these are deciding they

can't take the chance. Inventories of copper are down.

British Crippled—British industry is in for one of the biggest shut-downs of its history. The Confederation of Shipbuilding and Engineering Unions (40 trade union members) has called out 2.2 million men to date. They say they will call out 1 million more by April 6. Shipbuilders have 200,000 men idle. British labor observers expect the total to top 3 million.

Not much copper is being fabricated in England these days. But despite this the price actually took a jump to over 30¢ per lb. Financial circles say higher wages (the Confederation is asking 10 pct more) will result in higher prices and bring on an inflationary period. This could peg the London copper permanently higher and relieve the downward pressure on the U. S. price.

The confusion in Chile centers around the disagreement between the union and the government. Under anti-inflation legislation a ceiling of 30.16 pct is set on wage increases. This is what the Kennecott subsidiary is offering. The union is asking 40 pct.

Law Under Attack—Observers say it is an attempt to make the government back down on this ceiling. Under copper legislation the government has the right to dictate terms to both Braden and the union. But it isn't as easy as it sounds.

The last time the union bucked the government on a statute in the copper law, troops were sent to enforce the back-to-work order. The union members took to the hills and held secret meetings.

The current strike could be an extended one. The Braden El Teniente capacity is 15,000 tons per month.

Suggestion Plan

Kennecott Copper Co. has set up a fat awards-for-suggestions plan which could net a bright employee as much as \$50,000.

Basis of awards: An employee whose suggestion is adopted is entitled to 25 pct of the net savings. Maximum for a nonpatentable suggestion is \$25,000, for one that is patented \$50,000.

To qualify, a suggestion must improve existing methods, improve quality of product, or make other contributions.

Tin prices for the week: March 27—100.625; March 28—99.75; March 29—99.125; April 1—98.875, April 2—98.875.*

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/66
Aluminum pig	25.00	24.00	8/10/66
Copper (E)	32.00	34.00	2/18/67
Copper (CS)	31.50	30.50	4/1/57
Copper (L)	32.00	34.00	2/18/67
Lead, St. L.	15.50	16.30	1/13/66
Lead, N. Y.	16.00	16.50	1/13/66
Magnesium ingot	36.00	34.50	8/13/66
Magnesium pig	35.25	33.75	8/13/66
Nickel	74.00	64.50	12/6/66
Titanium sponge	250-275	270-300	12/4/66
Zinc, E. St. L.	13.50	13.00	1/6/66
Zinc, N. Y.	14.00	13.50	1/6/66

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig. Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 152.

Monthly Average Metal Prices

(Cents per lb except as noted)
Average prices of the major nonferrous metals in March based on quotations appearing in THE IRON AGE, were as follows.

Electrolytic copper, del'd	
Conn. Valley	33.136
Copper, Lake	33.181
Straits Tin, New York	99.701
Zinc, E. St. Louis	13.50
Lead, St. Louis	15.80
Aluminum ingot, frt allow'd	27.10

Note: Quotations are going prices.

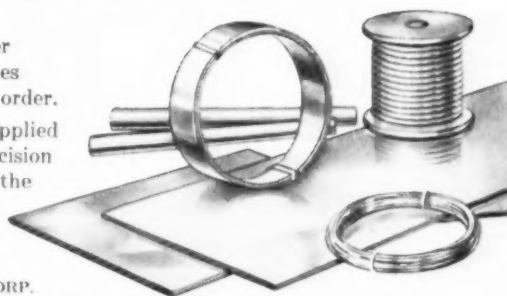


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Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.

NONFERROUS PRICES (Effective April 2, 1957)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("H" temper except 6061-0)

Alloy	.032	.081	.136- .249	.250- 3.
1800, 1100,				
3003.....	44.3	42.1	40.9	40.2
5052.....	51.8	46.8	45.1	42.9
6061-0.....	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6" S.....	42.7-44.4	57.6-61.1
12-14.....	43.4-44.8	58.4-62.7
24-26.....	46.4-46.9	68.7-73.1
36-38.....	54.8-55.4	91.5-94.9

Screw Machine Stock—2011-T-3

Size*	3/4	7/8-1/2	1-1/4	1-1/2
Price....	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage.....	\$1.352	\$1.803	\$2.254	\$2.704
.024 gage.....	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓	Gage→	.250- 3.00	.250- 2.00	.188	.081	.032
AS1B Stand, Grade.....			67.9	69.0	77.9	103.1
AS1B Spec.....			93.3	95.7	108.7	171.3
Tread Plate.....			70.6	71.7		
Tooling Plate.....		73.0				

Extruded Shapes

Factor→	6-8	12-14	24-36	36-38
Comm. Grade (AS1C).....	69.6	70.7	75.6	89.2
Spec. Grade... (AS1B).....	84.6	85.7	90.6	104.2

Alloy Ingot

AS1B (Die Casting)..... 37.26 (delivered)
AS2A, AS2A, AS21C (Sand Casting) 40.78 (Velaeco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR.....	126	106	128
Strip, CR.....	124	108	138
Rod, bar, HR.....	107	89	109
Angles, HR.....	107	89	109
Plates, HR.....	120	105	121
Seamless tube.....	157	129	200
Shot, blocks.....		87	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	54.13	.....	51.36	54.32
Brass, 70/30.....	47.52	48.08	47.46	50.43
Brass, Low.....	50.30	50.74	50.14	53.01
Brass, R.L.....	51.14	51.68	51.08	53.95
Brass, Naval.....	51.69	.....	46.00	55.10
Muntz Metal.....	49.79	.....	45.60	.....
Comm. Br.....	52.63	53.17	52.57	55.19
Mang. Br.....	55.43	.....	49.53	.....
Phos. Br. 5%.....	73.17	.....	73.67	.....

Free Cutting Brass Rod..... \$37.68

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$11.00-
\$12.10; alloy, \$14.75; Plate, HR, commercially
pure, \$9.25-\$9.75; alloy, \$11.25. Write, rolled
and/or drawn, commercially pure, \$8.50-\$9.00;
alloy, \$11.00; Bar, HR or forged, commercially
pure, \$7.10-\$7.55; alloy, \$7.10-\$7.50; billets, HR,
commercially pure, \$6.85-\$7.10; alloy, \$6.85-
\$7.05.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be..... \$74.78
Beryllium copper, per lb cont'd Be, \$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading..... \$71.50
Bismuth, ton lots..... 3.25
Cadmium, del'd..... 1.70
Calcium, 99.9%, small lots..... 4.55
Chromium, 99.8% metallic basis... 1.31
Cobalt, 97-99% (per lb)..... \$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami,
Okla., refined..... \$48.50-\$53.50
Gold, U. S. Treas., per troy oz..... \$35.00
Indium, 99.9% dollars per troy oz..... 2.35
Iridium, dollars per troy oz..... \$90 to \$100
Lithium, 98%..... \$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask,
f.o.b. New York..... \$255 to \$257
Nickel oxide sinter at Copper
Cliff, Ont., contained nickel..... 71.25
Palladium, dollars per troy oz..... \$23 to \$24
Platinum, dollars per troy oz..... \$92 to \$95
Rhodium..... \$120.00 to \$125.00
Silver ingots (¢ per troy oz)..... 91.375
Thorium, per kg..... \$42.00
Uranium, normal per kg..... \$40.00
Vanadium..... 3.45
Zirconium sponge..... \$10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115..... 31.50
No. 120..... 30.00
No. 123..... 28.50
80-10-10 ingot
No. 305..... 35.50
No. 315..... 33.50
88-10-2 ingot
No. 210..... 43.25
No. 215..... 40.00
No. 245..... 35.50
Yellow ingot
No. 405..... 35.25
Manganese bronze
No. 421..... 28.50

Aluminum Ingot

(Cents per lb del'd 20,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max..... 24.75-25.50
0.60 copper max..... 24.50-25.25
Piston alloys (No. 122 type)..... 22.25-23.50
No. 12 alum. (No. 2 grade)..... 22.50-23.50
108 alloy..... 22.50-23.50
135 alloy..... 24.50-25.25
13 alloy (0.60 copper max.)..... 24.50-25.25
AXS-679..... 22.50-23.50

Steel deoxidizing aluminum, notch bar
granulated or shot

Grade 1—95-97 1/2%..... 23.00-23.75
Grade 2—92-95%..... 21.75-22.00
Grade 3—90-92%..... 20.75-21.50
Grade 4—85-90%..... 20.25-20.75

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for
shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	25	21
Yellow brass.....	21 1/2	20 1/2
Red brass.....	25	24
Comm. bronze.....	25 1/2	26 1/2
Mang. bronze.....	20 1/2	19
Yellow brass rod ends	31 1/2	.....

Customs Smelters Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire..... 27 1/2
No. 2 copper wire..... 25 1/2
Light copper..... 23 1/2
Refinery brass..... 24 1/2
Copper bearing material..... 23 1/2-24
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire..... 27 1/2
No. 2 copper wire..... 25 1/2
Light copper..... 23 1/2
No. 1 composition..... 23
No. 1 comp. turnings..... 23
Hvy. yellow brass solids..... 17 1/2
Brass pipe..... 19
Radiators..... 18

Aluminum

Mixed old cast..... 14 1/2-15
Mixed new clips..... 16-17
Mixed turnings, dry..... 15-16

Dealer's Scrap

(Dealers' buying price f.o.b. New York
in cents per pound)

Copper and Brass

No. 1 copper wire..... 23 1/2-24 1/2
No. 2 copper wire..... 22 1/2-23 1/2
Light copper..... 20 1/2-20 3/4
Auto radiators (unsweated)..... 15-15 1/2
No. 1 composition..... 20 1/2-21
No. 1 composition turnings..... 20-20 1/2
Cocks and faucets..... 16-16 1/2
Clean heavy yellow brass..... 14-14 1/2
Brass pipe..... 16 1/2-17
New soft brass clippings..... 18 1/2-19
No. 1 brass rod turnings..... 15 1/2-16

Aluminum

Alum. pistons and struts..... 5-5 1/2
Aluminum crankcases..... 10-10 1/2
1100 (2S) aluminum clippings..... 13 1/2-14
Old sheet and utensils..... 10-10 1/2
Borings and turnings..... 8 1/2-7
Industrial castings..... 10-10 1/2
2024 (24S) clippings..... 11 1/2-12

Zinc

New zinc clippings..... 6 1/2-7
Old zinc..... 4 1/2-5
Zinc routings..... 2 1/2-3 1/2
Old die cast scrap..... 2 1/2-3 1/2

Nickel and Monel

Pure nickel clippings..... \$1.55-\$1.65
Clean nickel turnings..... \$1.30-\$1.40
Nickel anodes..... \$1.55-\$1.65
Nickel rod ends..... \$1.55-\$1.65
New Monel clippings..... 70-75
Clean Monel turnings..... 55-60
Old sheet Monel..... 65-70
Nickel silver clippings, mixed..... 21
Nickel silver turnings, mixed..... 18

Lead

Soft scrap lead..... 12-12 1/2
Battery plates (dry)..... 6 1/2-6 3/4
Batteries, acid free..... 3 1/2-4

Miscellaneous

Block tin..... 75-76
No. 1 pewter..... 50-60
Auto babbitt..... 35-40
Mixed common babbitt..... 12-12 1/2
Solder joints..... 17 1/2-18
Siphon tops..... 43
Small foundry type..... 14 1/2-14 3/4
Monotype..... 14-14 1/2
Lino. and stereotype..... 13-15 1/2
Electrotype..... 12 1/2-12 3/4
Hand picked type shells..... 9 1/2-10
Lino. and stereo. dross..... 4 1/2-5
Electro. dross..... 4-4 1/2

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

**STEEL
PRICES**(Effective
April 2, 1957)

		BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
		Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.			\$107.00 B3		5.05 B3	7.40 B3	5.05 B3						
	Buffalo, N. Y.	\$74.00 B3, R3	\$91.50 B3, R3	\$107.00 B3, R3	5.90 B3	5.05 B3	7.40 B3	5.05 B3	4.675 B3, R3	6.85 R7	6.95 B3			
	Claymont, Del.													
	Harrison, N. J.													14.55 C11
	Consabohocken, Pa.		\$96.50 A2	\$114.00 A2					4.725 A2	6.90 A2	6.95 A2			
	New Bedford, Mass.									7.30 R6				
	Johnstown, Pa.	\$74.00 B3	\$91.50 B3	\$107.00 B3		5.05 B3	7.40 B3							
	Boston, Mass.									7.40 T8				14.90 T8
	New Haven, Conn.									7.30 D1				
	Baltimore, Md.									6.85 T8				
	Phoenixville, Pa.					5.85 P2		5.85 P2						
	Sparrows Pt., Md.								4.675 B3		6.95 B3			
MIDDLE WEST	Bridgeport, Wallingford, Conn.	\$79.00 N8	\$96.50 N8	\$107.00 N8						7.30 W1 6.95 N8				
	Pawtucket, R. I. Worcester, Mass.									7.48 A5,N7				14.90 N7
	Alton, Ill.								4.875 L1					
	Ashland, Ky.								4.675 A7					
	Canton-Massillon, Dover, Ohio		\$94.00 R3	\$107.00 R3, T5						6.85 G4		10.10 G4		14.55 G4
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$74.00 U1, R3	\$91.50 U1, R3,W8	\$107.00 U1, R3,W8	5.90 U1	5.00 U1,W8 5.00 P13	7.35 U1, Y1 6.00 W8	5.00 U1	4.675 N4 4.675 A1	6.95 A1,T8 6.95 M8			7.75 W8, S9	14.55 A1, S9,T8
	Cleveland, Ohio									6.85 A5,J3			7.75 J3	
	Detroit, Mich.			\$107.00 R5					4.775 G3, M2	6.95 M2,G3, D2,P11	7.05 G3	10.10 G3, D2	7.75 G3	
	Anderson, Ind.									6.85 G4		10.10 G4		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$74.00 U1	\$91.50 U1	\$107.00 U1, Y1	5.90 J3	5.00 U1	7.35 U1,J3	5.25 J3	4.675 U1, J3,Y1	6.85 Y1	6.95 U1, J3,Y1	10.20 Y1	7.75 U1, Y1	
	Sterling, Ill.	\$74.00 N4				5.00 N4			4.775 N4					
WEST	Indianapolis, Ind.									7.00 C5				
	Newport, Ky.												7.75 A9	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		\$91.50 S1, C10	\$107.00 S1, C10					4.675 S1, R3	6.85 T4	6.95 S1, R3	10.90 S1, R3	7.75 S1	14.55 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$74.00 U1	\$91.50 U1, C11	\$107.00 U1, C11	5.90 U1	5.00 U1, J3	7.35 U1, J3	5.00 U1	4.675 P6	5.750 P6 6.85 J3,B4, S7			7.75 S9	14.55 S9
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 W3			4.675 W3	6.85 W3,F3	6.95 W3	9.85 W3		
	Youngstown, Ohio	\$74.00 R3	\$91.50 Y1, C10	\$107.00 Y1			7.35 Y1		4.675 U1, Y1	6.85 Y1,C5	6.95 U1, Y1	10.20 Y1	7.75 U1, Y1	
	Fontana, Cal.	\$83.50 K1	\$101.00 K1	\$128.00 K1		5.75 K1	8.10 K1	5.90 K1	5.525 K1	8.70 K1				
	Geneva, Utah		\$91.50 C7			5.00 C7	7.35 C7							
	Kansas City, Mo.					5.10 S2	7.45 S2		4.925 S2		7.20 S2			
	Los Angeles, Torrance, Cal.		\$101.00 B2	\$127.00 B2		5.70 C7, B2	8.05 B2		5.425 B2, C7	8.90 C1			8.95 B2	
SOUTH	Minnequa, Colo.					5.30 C6			5.775 C6					
	Portland, Ore.					5.75 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$101.00 B2			5.65 B2	8.00 B2		5.425 C7,B2					
	Seattle, Wash.		\$105.00 B2			5.75 B2	8.10 B2		5.675 B2					
	Atlanta, Ga.								4.875 A8					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$74.00 T2	\$91.50 T2			5.00 T2,R3 5.25 C16	7.35 T2		4.675 T2,R3 4.975 C10 4.925 C16		6.95 T2			
	Houston, Lone Star, Texas	\$80.00 L3	\$96.50 S2	\$112.00 S2		5.10 S2	7.45 S2		4.925 S2		7.20 S2			

IRON AGE

STEEL
PRICES(Effective
April 2, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hyvr.	Cold- rolled	Galvanized	Enamel- ing	Long Tone	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.675 B3	5.75 B3				6.90 B3	8.525 B3		5.80 W6	† Special coated mfg. terms deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25-lb. coke base box. * COKE: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conschockon, Pa.	4.725 A2	5.80 A2				6.95 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									5.80 B3			
	Fairless, Pa.	4.725 U1	5.80 U1				6.95 U1	8.575 U1			\$9.80 U1	\$8.50 U1	
	New Haven, Conn.												
	Phoenixville, Pa.												
MIDDLE WEST	Sparrows Pt., Md.	4.675 B3	5.75 B3	6.30 B3			6.90 B3	8.575 B3	9.275 B3	5.90 B3	\$9.80 B3	\$8.50 B3	
	Worcester, Mass.									6.10 A5			
	Trouton, N. J.												
	Alton, Ill.									6.00 L1			
	Ashland, Ky.	4.675 A7		6.30 A7	6.325 A7								
	Canton-Masonville, Dover, Ohio			6.30 R3, R1									
	Chicago, Joliet, Ill.	4.675 W8, A1					6.90 U1			5.80 K2	5.80 A5, R3, N4, W8, K2		
	Stirling, Ill.										5.90 N4, K2		
	Cleveland, Ohio	4.675 J3, R3	5.75 J3, R3		6.325 R3		6.90 R3	8.525 R3, J3		5.80 A5			
	Detroit, Mich.	4.775 G3, M2	5.85 G3, 5.75 M2				7.00 G2	8.625 G3					
	Newport, Ky.	4.675 A9	5.75 A9										
WEST	Gary, Ind. Harbor, Indiana	4.675 U1, J3, Y1	5.75 U1, J3, Y1	6.30 U1, J3	6.325 U1, J3, Y1	6.70 U1	6.90 U1, Y1, J3	8.525 U1, Y1		5.80 Y1	\$9.70 U1, Y1	\$8.40 J3, U1, Y1	7.15 U1, Y1
	Granite City, Ill.	4.675 G2	5.95 G2	6.50 G2	6.525 G2							\$8.50 G2	7.25 G2
	Kokomo, Ind.			6.40 C9						5.90 C9			
	Mansfield, Ohio		5.75 E2			6.70 E2							
	Midweston, Ohio		5.75 A7	6.30 A7	6.325 A7	6.70 A7							
	Niles, Warren, Ohio Sharon, Pa.	4.675 S1, R3, N3	5.75 R3	6.30 R3	6.325 N3	6.70 N3	6.90 S1, R3	8.525 S1, R3				\$8.40 R3	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 U1, J3, P6	5.75 U1, J3, P6	6.30 U1, J3	6.325 U1		6.90 U1, J3, R3	8.525 U1, J3	9.275 U1	5.80 A5, P6, J3	\$9.70 J3, U1	\$8.40 U1, J3	7.15 U1, J3
	Portsmouth, Ohio	4.675 P7	5.75 P7							5.80 P7			
	Weirton, Wheeling, Follinsbee, W. Va.	4.675 W3, W5	5.75 W3, W5, F3	6.30 W3, W5		6.70 W3, W5	6.90 W3	8.525 W3			\$9.70 W5, W3	\$8.40 W5, W3	7.15 W5, 7.40 W3
	Youngstown, Ohio	4.675 U1, Y1	5.75 Y1		6.325 Y1		6.90 Y1	8.525 Y1		5.80 Y1			7.15 Y1
SOUTH	Fontana, Cal.	5.525 K1	7.00 K1				7.75 K1	9.775 K1			\$10.45 K1	\$9.15 K1	
	Genova, Utah	4.775 C7											
	Kansas City, Mo.									6.05 S2			
	Los Angeles, Torrance, Cal.									6.60 B2			
	Minneapolis, Colo.									6.05 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.375 C7	6.70 C7	7.05 C7						6.60 C7	\$10.45 C7	\$9.15 C7	
	Seattle, Wash.												
	Atlanta, Ga.												
SOUTH	Fairfield, Ala.	4.675 T2, R3	5.75 T2	6.30 T2, R3						5.80 T2, R3	\$9.80 T2	\$8.50 T2	
	Alabama City, Ala.												
	Houston, Tex.									6.05 S2			

IRON AGE

STEEL
PRICES(Effective
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	BARS						PLATES				WIRE
	Carbon† Steel	Reinforc- ing	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mir's. Bright
EAST	Bethlehem, Pa.			6.125 B3	8.325 B3	7.40 B3					
	Buffalo, N. Y.	5.075 B3,R3	5.075 B3,R3	6.90 B5	6.125 B3,R3	8.325 B5,B3	7.40 B3	4.85 B3			7.20 W6
	Claymont, Del.						5.70 C4		6.85 C4	7.55 C4	
	Coatesville, Pa.						5.25 L4		6.85 L4	7.55 L4	
	Conschocken, Pa.						4.95 A2	5.925 A2	6.85 A2	7.25 A2	
	Harriaburg, Pa.						5.80 P2	6.275 P2			
	Hartford, Conn.		7.35 R3		8.625 R3	7.40 B3					
	Johansstown, Pa.	5.075 B3	5.075 B3		6.125 B3		4.85 B3		6.85 B3	7.25 B3	7.20 B3
	Fairless, Pa.	5.225 U1	5.225 U1		6.275 U1						
	Newark, N. J.			7.30 W10		8.50 W10					
	Camden, N. J.			7.30 P10		8.50 P10					
	Bridgeport, Conn. Putnam, Conn.	5.30 N8	5.30 N8	7.20 N8 7.40 W10	6.20 N8	8.475 N8	7.50 N8				
	Sparrows Pt., Md.		5.075 B3				4.85 B3		6.85 B3	6.85 B3	7.30 B3
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 M7	5.225 M7	7.40 B5,C14		8.625 A5 8.625 B5					7.50 A5,W6 9.025 T8
	Spring City, Pa.			7.30 K4		8.50 K4					
MIDDLE WEST	Alton, Ill.	5.275 L1									7.40 L1
	Ashland, Newport, Ky.						4.85 A7,A9		6.85 A9		
	Canton, Massillon, Ohio			6.85 R3,R2	6.125 R3,T5	8.325 R3,R2, T5					
	Chicago, Joliet, Ill.	5.075 U1,R3, W8,N4 5.075 P13	5.075 U1,R3, N4 5.075 P13	6.85 A5,B5, W10,L2 W8,N9	6.125 U1,R3, W8	8.325 A5,B5, W8,L2,N9, W10	5.875 W8 7.425 U1	4.85 U1,I3, W8,A1	5.925 U1	6.85 U1,W8	7.25 U1 7.20 A5,K2 R3,N4,W7
	Cleveland, Ohio	5.075 R3	5.075 R3	6.85 A5,C13		8.325 A5,C13	7.425 R3	4.95 J3,R3	5.925 J3		7.25 J3,R3 7.20 A5, C13
	Detroit, Mich.	5.175 G3	5.425 G3	7.05 B5,P8 7.10 P3 6.85 R5	6.225 G3	8.525 B5,P3, P8 8.325 R5	7.525 G3	4.95 G3		6.90 G3	
	Duluth, Minn.										7.20 A5
	Gary, Ind. Harbor, Crawfordsville	5.075 U1,I3, Y1	5.075 U1,I3, Y1	6.85 R3,M5	6.125 U1,I3, Y1	8.325 R3,M4	7.425 U1,I3, Y1	4.85 U1,I3, Y1	5.925 I3	6.85 U1,Y1	7.25 U1,Y1 7.30 M4
	Granite City, Ill.							5.05 G2			
	Kokomo, Ind.										7.30 C9
	Sterling, Ill.	5.175 N4	5.175 N4				4.85 N4				7.30 K2
	Niles, Warren, Ohio Sharon, Pa.			6.85 C10	6.125 C10,S1	8.325 C10	7.425 S1	4.85 S1,R3		6.85 S1	7.25 S1,R3
	Pittsburgh, Pa. Midland, Pa.	5.075 U1, C11,J3	5.075 U1,J3	6.85 A5,C8, J3,R3,S9 B4,W10,C11	6.125 U1, C11,J3	8.325 A5,R3, S9,C8,W10, C11	7.425 U1,J3	4.85 U1,J3	5.925 U1	6.85 U1,J3	7.25 U1,J3 7.20 A5,J3, P6
	Portsmouth, Ohio										7.20 P7
	Weirton, Wheeling, Follansbee, W. Va.						4.85 W5				
	Youngstown, Ohio	5.075 U1, Y1,R3	5.075 U1, Y1,R3	6.85 U1,Y1, F2	6.125 U1,Y1	8.325 Y1,F2	7.425 U1,Y1	4.85 U1,Y1, R3		6.85 Y1	7.25 Y1 7.25 U1
WEST	Emeryville, Cal.	5.825 J5	5.825 J5								
	Fantana, Cal.	5.775 K1	5.775 K1		7.175 K1		8.125 K1	5.60 K1		7.60 K1	8.00 K1
	Geneva, Utah							4.85 C7			7.25 C7
	Kansas City, Mo.	5.325 S2	5.325 S2		6.375 S2		7.675 S2				7.45 S2
	Los Angeles, Torrance, Cal.	5.775 C7,B2	5.775 C7,B2	8.30 R3,P14	7.175 B2	10.20 P14	8.125 B2				8.15 B2
	Minnequa, Colo.	5.525 C6	5.525 C6					5.70 C6			7.45 C6
	Portland, Ore.	5.825 O2	5.825 O2								
	San Francisco, Niles, Pittsburg, Cal.	5.775 C7 5.825 B2 6.825 P9	5.775 C7 5.825 B2 6.825 P9				8.175 B2				8.15 C7,C6
	Seattle, Wash.	5.825 B2 N6	5.825 B2				8.175 B2	5.75 B2		7.75 B2	8.15 B2
	Atlanta, Ga.	5.575 A8									7.40 A8
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	5.075 T2,R3 5.325 C16	5.075 T2,R3 5.325 C16	7.45 C16			7.425 T2	4.85 T2,R3			7.25 T2 7.20 T2,R3
	Houston, Ft. Worth, Lone Star, Tex.	5.325 S2	5.325 S2		6.375 S2		7.675 S2	4.95 S2 5.20 L3		6.95 S2	7.35 S2 7.45 S2

† Merchant Quality—Specialty Quality .35¢ higher.

STEEL PRICES

(Effective April 2, 1957)

Key to Steel Producers

With Principal Offices

- A1** Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland.
A7 Aranco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown

- F3** Follanabee Steel Corp., Follanabee, W. Va.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit

P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebbing Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Co., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Tumken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per) l.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.	
	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.
Sparrows Pt. B3	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Youngstown R3	9.25	+10.00	12.25	+6.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fontana K1	+3.75	+23.00	0.75	+19.00	2.75	+14 1/2	5.25	+12 1/2	5.75	+11 1/2	6.25	+11.25	7.75	+10.50								
Pittsburgh J3	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Alton, Ill. L1	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Sharon M3	9.25	+10.00	12.25	+2.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fairless N2	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Pittsburgh N1	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Wheeling W3	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Wheatland W4	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Youngstown Y1	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Indiana Harbor Y1	8.25	+9.00	13.25	+2.00	14.75	1.50	17.25	2.25	17.75	3.25	18.25	3.75	19.75	4.25								
Lorain N2	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. B3	11.75	+2.00	15.75	2.00	18.75	4.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Youngstown R3	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Fairless N2	11.75	+2.00	15.75	2.00	18.75	4.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Fontana K1	0.75		4.75		7.75		8.25		8.75		9.25		9.75									
Pittsburgh J3	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Alton, Ill. L1	11.75	+2.00	15.75	2.00	18.75	4.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Sharon M3	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Pittsburgh N1	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Wheeling W3	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Wheatland W4	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Youngstown Y1	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Indiana Harbor Y1	12.75	+1.00	16.75	3.00	19.75	7.50	20.25	6.25	20.75	7.25	21.25	7.75	21.75	6.50								
Lorain N2	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50

Threads only, butt weld and seamless 2 1/2 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 5 1/2 pt. higher discount.
 Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	\$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.185	T-2
1.5	4	1.5	—	—	1.04	M-1
5	4	3	—	—	1.43	M-3
6	4	3	—	—	1.185	M-2

High-carbon chromium... .83 D-3, D-5
Oil hardened manganese... .45 O-2
Special carbon... .41 W-1
Extra carbon... .345 W-1
Regular carbon... .29 W-1
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (A3, J2, L4)			Sheet (12)	
	10 pct	15 pct	20 pct	20 pct	
302					35.50
304	34.60	38.00	41.50		37.75
316	39.70	43.20	46.65		55.50
321	34.35	39.80	43.50		44.75
347	39.50	43.95	48.45		54.25
405	29.20	33.15	37.05		
410, 430	28.70	32.65	36.55		

CR Strip (S9) Copper, 10 pct, 2 sides, 39.85; 1 side, 33.00.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

WARE- HOUSES		Sheets			Strip	Plates	Shapes	Bars			Alloy Bars			
Cities	City Delivery; Charge	Hot-Rolled (16 ga. & over)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled	Standard Structural	Hot-Rolled (merchant)	Hot-Rolled (special quality)	Cold- Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed	
Atlanta		8.17	9.37	9.83	8.21	8.55	8.59	8.45	10.23					
Baltimore	\$ 10	7.79	8.99	9.12	8.27	8.12	8.57	8.34	9.09	14.99	14.44	18.39	18.09	
Birmingham	15	7.98	9.08		8.46	8.36	8.85	8.53	9.23					
Birmingham	15	7.68	8.88	9.52	7.78	8.01	8.05	8.07	8.44	10.04				
Boston	10	7.80	9.00		7.82	8.16	8.20		10.12					
Boston	10	8.94	9.98	11.16	8.99	9.28	9.20	9.17	9.57	15.79	14.79	19.14	18.39	
Buffalo	15	8.00	9.15	10.90	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.65	19.01	
Chicago	15	7.95	9.15	9.85	7.97	8.31	8.35	8.22	8.44	8.50	15.30	14.30	18.65	
Chicago	15	7.95	9.15	9.85	7.97	8.31	8.35	8.22	8.44	8.50	15.30	14.30	18.65	
Cincinnati	15	8.09	9.20	9.90	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.61	18.96	
Cincinnati	15	8.09	9.20	9.90	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.61	18.96	
Cleveland	15	7.93	9.13	9.75	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	
Cleveland	15	7.93	9.13	9.75	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	
Denver		9.55	11.09	12.41	9.70	9.80	9.60	9.75	10.54				19.79	
Denver		9.55	11.09	12.41	9.70	9.80	9.60	9.75	10.54				19.79	
Detroit	15	8.18	9.40	10.20	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	
Detroit	15	8.18	9.40	10.20	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	
Houston		8.80	9.75		8.85	8.80	9.10	9.15	10.65	15.50		19.30	19.05	
Houston		8.80	9.75		8.85	8.80	9.10	9.15	10.65	15.50		19.30	19.05	
Kansas City	20	8.52	9.72	10.07	8.60	8.83	8.87	8.73	9.42	15.32	14.77	18.72	18.42	
Kansas City	20	8.52	9.72	10.07	8.60	8.83	8.87	8.73	9.42	15.32	14.77	18.72	18.42	
Los Angeles	10	9.20	10.90	11.75	9.25	9.75	9.25	9.15	9.30	12.20	16.45	15.60	20.30	
Los Angeles	10	9.20	10.90	11.75	9.25	9.75	9.25	9.15	9.30	12.20	16.45	15.60	20.30	
Memphis	15	8.02	9.22		8.12	8.35	8.39	8.25	9.85					
Memphis	15	8.02	9.22		8.12	8.35	8.39	8.25	9.85					
Milwaukee	15	8.08	9.28	9.98	8.10	9.75	8.56	8.35	8.71	8.72	15.43	14.43	18.78	
Milwaukee	15	8.08	9.28	9.98	8.10	9.75	8.56	8.35	8.71	8.72	15.43	14.43	18.78	
New York	10	8.55	9.76	10.33	9.00	9.11	9.01	9.11	9.48	15.02	14.69	18.42	18.29	
New York	10	8.55	9.76	10.33	9.00	9.11	9.01	9.11	9.48	15.02	14.69	18.42	18.29	
Norfolk	20	8.00			8.40	8.35	8.70	8.45	10.70					
Norfolk	20	8.00			8.40	8.35	8.70	8.45	10.70					
Philadelphia	10	8.25	9.17	10.39	8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	
Philadelphia	10	8.25	9.17	10.39	8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	
Pittsburgh	15	7.93	9.14	10.20	8.07	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	
Pittsburgh	15	7.93	9.14	10.20	8.07	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	
Portland		8.90	9.65	11.40	10.25	9.00	9.35	9.45	13.55	16.70	16.10	20.40	20.25	
Portland		8.90	9.65	11.40	10.25	9.00	9.35	9.45	13.55	16.70	16.10	20.40	20.25	
San Francisco	10	9.05	10.40	10.90	9.05	9.30	9.15	9.15	9.90	12.40	16.45	15.60	20.30	
San Francisco	10	9.05	10.40	10.90	9.05	9.30	9.15	9.15	9.90	12.40	16.45	15.60	20.30	
Seattle		9.55	10.70	11.65	9.55	9.30	9.35	9.50	9.85	13.40	16.55	15.85	19.50	
Seattle		9.55	10.70	11.65	9.55	9.30	9.35	9.50	9.85	13.40	16.55	15.85	19.50	
Spokane	15	9.70	10.85	11.80	9.70	9.45	9.50	9.65	10.00	13.55		16.75	20.35	
Spokane	15	9.70	10.85	11.80	9.70	9.45	9.50	9.65	10.00	13.55		16.75	20.35	
St. Louis	15	8.29	9.49	10.21	8.34	8.67	8.82	8.58	8.96	9.11	15.66	14.66	19.01	
St. Louis	15	8.29	9.49	10.21	8.34	8.67	8.82	8.58	8.96	9.11	15.66	14.66	19.01	
St. Paul	15	8.29	9.64	10.31	8.39	8.71	8.75	8.52	9.21		14.62		18.27	
St. Paul	15	8.29	9.64	10.31	8.39	8.71	8.75	8.52	9.21		14.62		18.27	

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
† 16 gage. †† 13½¢ zinc. ‡ Deduct for country delivery.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field	9.00	9.20	
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Motor	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60		
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (W5); Brackbridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U); Warren, O. (R3) (20¢ higher, HR); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails		Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbed Wire	Merch. Wire Ann'd	Merch. Wire Galv.
	Col	Col	Col	Col	Col	e lb.	e lb.
Alabama City R1	167	181		195	187	8.10	8.50
Aliquippa, Pa. J3**	164	179			181	8.20	8.575
Atlanta A6**	166	182		192	190	8.05	8.65
Bartonsville A2**	166	182		198	190	8.30	9.00
Buffalo W6					8.20	8.75	
Chicago, Ill. N4**	164	180	167	196	188	8.35	9.10
Cleveland A6	173				8.20	8.75	
Cleveland A5					8.20		
Crawfordsville M4**	166	182		198	190	8.30	9.05
Donora, Pa. A5	164	176		196	184	8.20	8.75
Duluth A5	164	176	167	196	184	8.20	8.75
Fairfield, Ala. T2	164	176		196	184	8.20	8.75
Galveston D4	169						
Houston S2	169	181		195	189	8.20	8.60
Johnstown, Pa. B3**	164	180	167		188	8.20	8.95
Joliet, Ill. A5	164	176		196	184	8.20	8.75
Kokomo, Ind. C9*	166	178		198	186	8.30	8.85
Los Angeles B2**					189	8.20	8.60
Kansas City S2*	169	181		195	189	8.35	9.00
Minnequa C6*	169	181	172	195	189	8.45	9.60
Moneasen P6	167	185			191	8.10	8.10
Palmer, Mass. W6					8.50	9.05	
Pittsburg, Cal. C7	183	199		220	204	9.15	9.70
Rankin, Pa. A5	164	176			184	8.20	8.75
So. Chicago R1	167	181		195	187	8.10	8.50
S. San Francisco C6					214	8.30	9.30
Spartan T8, B3**	166			192	190	8.30	9.05
Struthers, O. Y1*					7.95	8.45	
Worcester A5	170				8.50	9.05	
Williamsport, Pa. S5		175					

* Zinc less than .10%. † Plus zinc extra.
** 13.5 zinc. ‡ Wholesalers only.
*** 10¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. T8	9.20	10.40	12.60	15.60	18.55
Bristol, Conn. W12		10.40	12.60	15.60	18.55
Boston T8, R1	9.20	10.40	12.60	15.60	18.55
Buffalo, N. Y. R7	8.65	10.10	12.30	15.30	18.25
Carnegie, Pa. S9	8.65	10.10	12.30	15.30	
Cleveland A5	8.65	10.10	12.30	15.30	18.25
Detroit D1	8.75	10.20	12.40	15.40	
Detroit D2	8.75	10.20	12.40		
Dover, O. G4	8.65	10.10	12.30	15.30	18.25
Evanston, Ill. M8	8.65	10.10	12.30	15.30	18.25
Franklin Park, Ill. T8	8.75	10.10	12.30	15.30	18.25
Harrison, N. J. C11		12.30	15.30	18.25	
Indianapolis C5	8.10	9.95	12.60	15.60	17.95
Los Angeles	10.85	12.30	14.50		
New Castle, Pa. B4	8.65	10.10	12.30	15.30	
New Haven, Conn. D1	9.10	10.40	12.60	15.60	
Pawtucket, R. I. N7	9.20	10.40	12.60	15.60	18.55
Pittsburgh S7	8.65	10.10	12.30	15.30	18.25
Riverdale, Ill. A1	8.75	10.10	12.30	15.30	18.25
Sharon, Pa. S1	8.65	10.10	12.30	15.30	18.25
Trenton R4	11.05	10.40	12.60	15.60	18.55
Wallingford W1	9.10	10.40	12.60	15.60	18.45
Warren, Ohio T4	8.65	10.10	12.30	15.30	18.25
Worcester, Mass. A5	9.20	10.40	12.60	15.60	18.55
Youngstown C3	7.95	9.80	12.60	15.00	17.95

ROILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	R.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	36.34	42.56	33.21	
	2½	12	48.94	57.31	44.73	
	3	12	56.51	66.18	51.66	
	3½	11	65.97	77.25	60.30	
	4	10	87.61	102.59	80.07	
National Tube	2	13	36.34	42.56	33.21	
	2½	12	48.94	57.31	44.73	
	3	12	56.51	66.18	51.66	
	3½	11	65.97	77.25	60.30	
	4	10	87.61	102.59	80.07	
Pittsburgh Steel	2	13	36.34	42.56		
	2½	12	48.94	57.31		
	3	12	56.51	66.18		
	3½	11	65.97	77.25		
	4	10	87.61	102.59		

(Effective April 2, 1957)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer U1	5.275	6.25	6.60				
So. Chicago R3				9.225			
Ensley T2	5.275	6.25					
Fairfield T2				9.225	6.275		
Gary U1	5.275	6.25			6.275		
Huntington C16		6.25					
Ind. Harbor I3	5.275		6.60	9.225	6.275		
Ind. Harbor Y1				8.775			
Johnstown B3		6.25					
Joliet U1			6.60				
Kansas City S2				9.225			13.85
Lackawanna B3	5.275	6.25	6.60		6.275		13.85
Lebanon B3							13.85
Minneapolis C6	5.275	6.75	6.60	9.225	6.275	13.85	
Pittsburgh P5				8.775	12.85		
Pittsburgh J3				9.225			
Seattle B2				9.725	6.425	13.16	
Steelton B3	5.275		6.60		6.275	13.85	
Spartan Y1				8.775			
Terrace C7						6.425	
Williamsport S5		6.15					
Youngstown R3				9.225			

COKE

Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa. \$15.00 to \$15.75
Foundry, beehive (f.o.b. oven)

Foundry oven coke	
Buffalo, del'd	\$31.76
Detroit, f.o.b.	30.60
New England, del'd	31.65
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.60
Swedeland, Pa., f.o.b.	29.60
Patnesville, Ohio, f.o.b.	30.60
Erie, Pa., f.o.b.	30.60
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
Birmingham, f.o.b.	31.60
Milwaukee, f.o.b.	28.85
Neville, Pa.	29.25

ELECTRODES

Cents per lb f.o.b. plant, threaded, with
nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
8	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2 1/2	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb, f.o.b. shipping point)	
Copper	
Cast elliptical, 18 in. or longer,	
5000 lb lots	49.42
Electrodeposited	39.25
Brass, 80-20, ball anodes, 2000 lb	
or more	50.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon,	
5000 lb	\$1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	\$1.70
Tin, ball anodes and elliptical \$1.07 per in.	

Chemicals	
(Cents per lb, f.o.b. shipping point)	
Copper cyanide, 100 lb drum	76.00
Copper sulphate, 100 lb bags, per	
cwt	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed,	
300 lb	45.50
Sodium cyanide, domestic, f.o.b.	
N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 to 300 lb	55.55
Potassium cyanide, 100 lb drum	
N. Y.	48.00
Chromic acid, flake type, 1 to 20	
100-499 lb drums	31.75

BOLTS, NUTS, RIVETS, SCREWS(Base discount, f.o.b. mill)
Pot Discounts

Machine and Carriage Bolts	Full Container Price	30 Con- tainers	20,000 Lb.	40,000 Lb.
1/4" and smaller x 6" and shorter	52 1/2	50 1/2	58 1/2	59 1/2
1/4" thru 1" x longer than 6"	43 1/2	47 1/2	50	51 1/2
Rolled thread carriage bolts 1/4 in. & smaller x 6 in. and shorter	52 1/2	50 1/2	58 1/2	59 1/2
Lag, all diam. x 6" & shorter	52 1/2	50	58	59
Lag, all diam. longer than 6 in.	44 1/2	48	50	51
Flow bolts, 1/4" and smaller x 6" and shorter	52	55 1/2	57	58

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full Case or Keg Price
1/4 in. or smaller	61 1/2
1/2 in. to 1 1/4 in. inclusive	57 1/2
1 1/2 in. to 1 3/4 in. inclusive	62 1/2
1 3/4 in. and larger	56

C. P. Hex reg. & hvy.

1/4 in. and smaller	61 1/2
1/2 in. to 1 1/4 in. inclusive	57 1/2
1 1/2 in. and larger	56

Hot Galv. Nuts (All Types)

1/4 in. and smaller	48
---------------------	----

Semi-finished Hex Nuts

1/4 in. or smaller	61 1/2
1/2 in. to 1 1/4 in. inclusive	57 1/2
1 1/2 in. and larger	56

(Add 25 pct for broken case or keg quantities)

Finished

1 in. and smaller	64
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Rivets

	Base per 100 lb
1/4 in. and larger	\$11.60
7/16 in. and smaller	23

Cap ScrewsDiscount (Packages)
Bright Treated H. C. Heat

New std. hex head, pack- aged	
1/4" diam. and smaller x 6" and shorter	44 31
1/2" and shorter	27 9
1/4" diam. and smaller x longer than 6"	14 + 6
1/2" and 1" diam. & longer than 6"	1/2 + 24
C-1018 Steel Full-Finished Cartons Bulk	
1/4" through 1/2" dia. x 6" and shorter	44 61
1/2" through 1" dia. x 6" and shorter	27 49
Minimum quantity—1/4" through 1/2" diam., 15,000 pieces; 1/2" through 1" diam., 5,000 pieces; 1" through 1 1/2" diam., 2,000 pieces.	

Machine Screws & Stove Bolts

	Discount	Mach. Screws	Stove Bolts
Plain Finish			
Cartons	19	23	
Bulk			
To 1/4" diam. incl.	25,000-200,000	9	84
5/16 to 1/2" diam. incl.	15,000-100,000	9	84
All diam. over 3" long	5,000-100,000	—	84

Machine Screw & Stove Bolt Nuts

	Discount	Hex	Square
In cartons	18	19	
In Bulk			
1/4" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.7
Chicago	134.1
San Francisco-L. A.	141.8
Dec. 1955 value, Class B or heavier	
6 in. or larger, bell and spigot pipe, Haz- ardation, p. 57, Sept. 1, 1955, issue.	
Source: U. S. Pipe and Foundry Co.	

REFRACTORIES**Fire Clay Brick**

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	\$128.08
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$2.00)	\$20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$140.00
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah	144.00-165.00
California	170.00

Super Duty

Hays, Pa., Athens, Tex., Wind- ham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chi- cago	24.00
Silica cement, net ton, bulk, Ens- ley, Ala.	25.50
Silica cement, net ton, bulk, Mt. Union	23.80
Silica cement, net ton, bulk, Utah and Calif.	25.00

Chrome Brick

	Per net ton
Standard chemically bonded, Balt.	\$98.00
Standards chemically bonded, Curt- ner, Calif.	108.00
Burned, Balt.	92.00

Magnesite Brick

Standard, Baltimore	\$121.00
Chemically bonded, Baltimore	109.00

Grain Magnesite St. % to 1/4-in. grains

Domestic, f.o.b. Baltimore in bulk	\$69.40
Domestic, f.o.b. Chewah, Wash., Luning, Nev.	
in bulk	43.00
in sacks	49.00

Dead Burned Dolomite

	Per net ton
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	\$16.00
Midwest	16.38
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh	
Swedish sponge iron f.o.b.	
Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron,	
Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+%	
Fe, carload lots	8.5¢
Electrolytic iron, annealed,	
imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed	
minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting	
stock, 99.84% pure	22.00
Carbonyl iron size 5 to 10 micron, 98%, 99.8+%, Fe.	86.0¢ to \$1.55
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	\$7.50¢ to \$8.00¢
Copper, electrolytic	49.75¢
Copper, reduced	49.75¢
Cadmium, 100-199 lb, 95% plus metal value	
Chromium, electrolytic, 99.85% min. Fe .03 max. Del'd	\$5.00
Lead	8.90¢ plus metal value
Manganese f.o.b. Exton, Pa.	46.0¢
Molybdenum, 99%	\$3.60 to \$3.95
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.00
Nickel, spherical, unannealed	
#20	\$1.13
Silicon	48.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	39.0¢
Stainless steel, 316	\$1.51
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$4.20
Zinc, 10 ton lots	18.75¢ to \$2.50¢

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IN STAINLESS STEEL SCRAP**

Our 56th Year

FERROALLOY PRICES

(Effective April 2, 1937)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-100% max. Si.

0.02% C ...	41.50	0.20% C ...	38.50
0.03% C ...	41.00	0.50% C ...	38.25
0.06% C ...	39.50	1.00% C ...	37.50
0.10% C ...	39.00	1.50% C ...	37.35
0.15% C ...	38.75	2.00% C ...	37.25
4.00-4.50% C, 67.70% Cr, 1-2% Si...	27.75		
3.50-4.90% C, 57-64% Cr, 2.00-4.50% Si...	27.75		
0.025% C (Simplex) ...	34.75		
0.10% C, 50-52% Cr, 2% max Si ...	35.50		
8.50% max. C, 50-55% Cr, 3-6% Si ...	24.00		
8.50% C, 50-55% Cr, 3% max. Si...	24.00		

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C ...	\$1.31
0.50% max. C ...	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe ...	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads ...	\$1.29
Ton lots ...	1.31
Less ton lots ...	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads ...	41.65
Ton lots ...	48.95
Less ton lots ...	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

30-33% Cr, 60-65% Si, 3.00 max. Fe.	25.65
Ton lots ...	27.95
Less ton lots ...	29.45

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.	24.25
Ton lots ...	26.15
Less ton lots ...	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 1 1/2 mesh.

Ton lots ...	20.15
Less ton lots ...	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-6; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots ...	17.80
Ton lots ...	18.70
Less ton lots ...	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed ...	18.50
Ton lot to carload packed ...	19.65
Less ton lots ...	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point

Marquette, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk ...	14.80
Ton lots packed ...	17.30

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese Silicon	
15 to 19% 3% max.	\$109.50
19 to 21% 3% max.	102.50
21 to 23% 3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	45.75
Carload, packed ...	47.25
Ton lots ...	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads ...	34.00
Ton lots ...	36.00
250 to 1999 lb ...	38.00
Premium for Hydrogen-removed metal ...	9.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% mn ...	37.15	39.95	41.15
0.07% max. C ...	35.10	37.90	39.10
0.10% max. C ...	34.35	37.15	38.35
0.15% max. C ...	33.60	36.40	37.40
0.30% max. C ...	32.10	34.90	36.10
0.50% max. C ...	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk ...	12.80
Ton lots ...	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet ...	14.10
Ton lots, packed ...	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.75% Si, 1.25% Fe ...	23.70	22.40
98% Si, 0.75% Fe ...	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk ...	7.70
Ton lots, packed ...	10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si ...	13.00	75% Si ...	16.80
65% Si ...	15.65	85% Si ...	18.50
		90% Si ...	19.90

Ferrovandium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth ...	3.30
Crucible ...	3.30
High speed steel (Primox) ...	3.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots ...	\$2.05	\$2.95	\$3.75
Less ton lots ...	2.40	3.30	4.55

Alisfer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ...	10.65¢
Ton lots ...	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound

Contained Mo ... \$1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered

per pound contained Cb.

Ton lots ...	\$6.90
Less ton lots ...	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract

basis, del'd ton lots, 2-in. x D per lb con't Sb plus Ta ... \$4.95

Ferromolybdenum, 55-75%, 200-lb

containers, f.o.b. Langeloth Pa., per pound contained Mo ... \$1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt.

Pleasant, Tenn., \$4.00 unitage, per gross ton ... \$90.00

10 tons to less carload ...	\$110.00
-----------------------------	----------

Ferrotitanium, 40% regular grade

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb. contained Ti ... \$1.35

Ferrotitanium, 35% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.50

Less ton lots ...	\$1.54
-------------------	--------

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton ... \$240.00

Ferrotungsten, 1/4 x down,

packed, per pounds contained W, ton lots delivered ... \$3.15

Molybde oxide, briquets, per lb

contained Mo, f.o.b. Langeloth, Pa. ... \$1.41

Sinamal, 20% Si, 30% Mn, 30%

Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk lump ... 18.50¢

Ton lots, packed lump ...	20.50¢
Less ton lots ...	21.00¢

Vanadium oxide, 86-89% V₂O₅,

contract, basis, per pound contained V₂O₅ ... \$1.38

Zirconium contract basis, per lb

of alloy 35-40% f.o.b. freight allowed, carloads, packed ... 27.25¢

12-15%, del'd lump, bulk-carloads ...	9.25¢
---------------------------------------	-------

Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload ...	\$5.50
---------------------	--------

Bortam, f.o.b. Niagara Falls,

Ton lots per pound ... 45¢

Less ton lots, per pound ...

50¢

Corbortam, Ti 15-21%, B 1-2%,

Si 2-4%, Al 1-2%, C 4-5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ...

14.00¢

Ferroboreon, 17.50 min. B, 1.50%

max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots ... 1.20

F.o.b. Wash., Pa., Niagara Falls,

N. Y., delivered 100 lb up

10 to 14% B85

14 to 19% ... 1.20

19% min. B ... 1.50

Grainal, f.o.b. Bridgeville, Pa.,

freight allowed, 100 lb and over No. 1 ... \$1.05

No. 79 ...

50¢

Manganese-Boron, 75.00% Mn,

15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

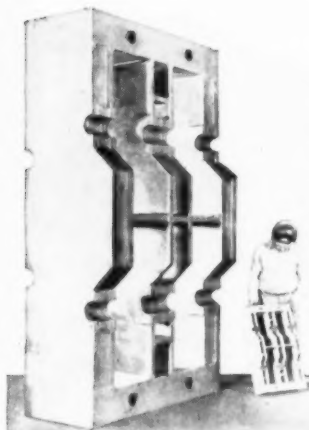
Ton lots ... \$1.46

Less ton lots ... 1.5

Nickel-Boron, 15-18% B, 1.00%

max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... \$2.15

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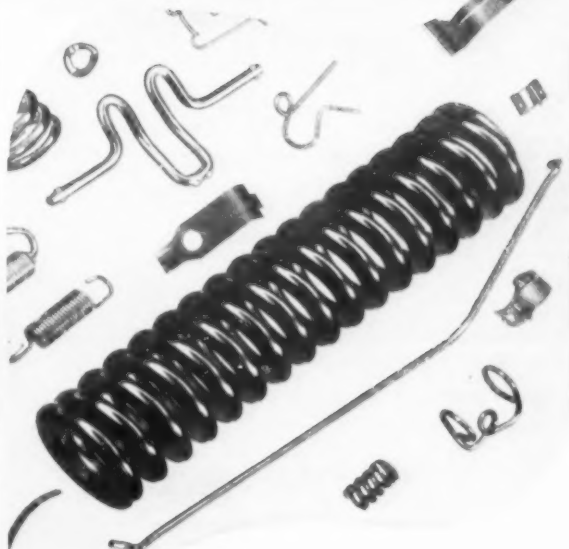
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24" BEAMS 95/99# 40'
26" WF BEAMS X 160# 65'
28" WF BEAMS X 106# 40'-42'
5"-8"-10"-12" "H" COLUMNS

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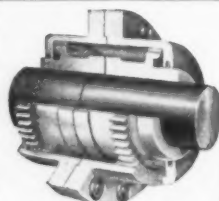
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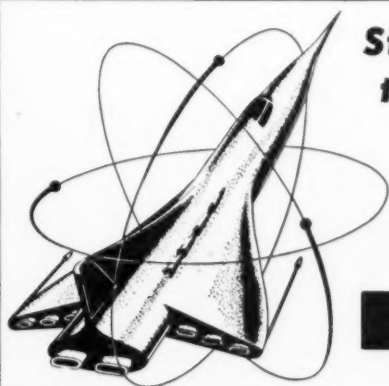
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of the structural components for these complex installations because of Engineering-Design know-how and top-notch fabricating facilities. See for yourself how well these facilities can work for you on your next job. Write:

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Box 1487

Boise, Idaho



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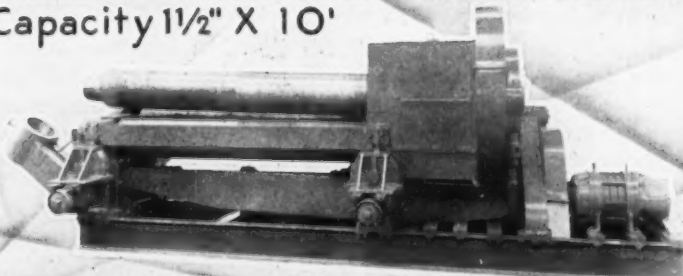
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classes of sheet
metal, plate and
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Cars

Hopper Type Ore Cars

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**"ANYTHING containing IRON
or STEEL"**

THE CLEARING HOUSE

Fast Tax Write-Off Hopes Are Dim

Used machinery buyers probably won't get aid on rapid depreciation this year.

Capitol's cold shoulder to tax cuts means the measure can't get off the ground.

■ Congress, in refusing to consider lower taxes this year, has apparently delivered the knockout blow to plans for rapid depreciation on used machinery and used industrial equipment.

There's still a possibility that there might be some action on the measure during the balance of this session but the odds are fairly heavy against S. 351.

Long Wait—This was the bill designed to amend the internal revenue code so that purchasers of used equipment could get the same privileges of accelerated depreciation as those extended to buyers of new equipment.

Sen. Sparkman, D-Ala., had urged this and other liberalizations of the tax laws during Senate debate on the tax bill, the IRON AGE Washington office reports. However, all such changes were voted down. And with them went hopes for Senate Bill 351 introduced by Sparkman in January.

The baseball cry of "wait till next year" seems indicated now. A sizable bloc of members in both the House of Representatives and the Senate is determined to push still harder then for such features as lowering the 52 pct income tax rate as it applies to firms with less than \$25,000 net income and for tax-liberalizing features such as fast depreciation on used machinery.

Cleveland Stronger

A surge of small defense and regular government contract work apparently stemming from the Mid-East crisis is putting additional life into the Northeastern Ohio used machinery business.

"We have noticed that defense subcontractors, large and small, are now in a hurry to get used machinery in good condition to start batting out government business. This new trend is taking up the slack left by the auto parts suppliers," says Earle Wade, of Wade Machinery Co., Wickliffe, O., a suburb of Cleveland.

Rush Orders — In some cases large companies which rarely put in used machinery are now actively shopping the dealers for units in top shape because production can't wait for delivery of new units. The shoppers include leading automotive suppliers who are using idle facilities and sandwiching in a few used machines to form a temporary line for the government work. Others include the third rank of tool and die firms, accessories makers, etc., who supply the suppliers.

Standard machine tools are still the ones most sought by buyers in the Northeastern Ohio area and still the most difficult for dealers to come by. They include principally grinders, engine lathes with up to 20 ft centers, vertical turret lathes, radial drills and sheet metal equipment.

Most buyers will refuse to look at machinery built prior to 1950 so salable units become increasingly harder to locate. Many dealers continue to label some pre-war machines as "late types." However, it isn't proving effective as buyers still give them the cold shoulder.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS

6" 3/16" Niagara Initial Type

10" x 1/4" Kling Pyramid Type

BRACKS—LEAF TYPE

8" x 3/16" Drels & Krump

12" x 1/4" Drels & Krump

BRACKS—PRESS TYPE

12" x 5/16" Cincinnati—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H 56' Span 220/3/60

5 ton Whiting 48' Span 220/3/60 A.C.

5 ton Shaw 58' Span 230 Volt D.C.

8 ton P&H 55' Span 220/3/60

10 ton P&H 38' Span 230 Volt D.C.

10 ton R&M 40' Span 220/3/60 A.C.

25 ton Cleveland 70' Span 220/3/60 A.C.

With 10 ton Auxiliary

DIEING MACHINE

60 ton Henry & Wright, Roll Feed, Scrap Cutter

4" Stroke NDW 1950

DRAW BENCH

10,000# Aetna Standard, Length of Draw 44'. Used

to draw S.A.E. 1025 Welded Steel Tubing

FORGING MACHINES

1" to 3" Acme, Ajax, National

3" Acme Model XX, Air Clutch, NEW 1954

HAMMERS—BROAD DROP—STEAM DROP—STEAM

FORGING—800 lb to 20,000 lb.

LEVELER—STRETCHER

100 ton Hydr. Stretcher Leveler, Capy. 632" Ga.

36" Width, 96" Length; 4 sheets in a Pack

LEVELLERS—ROLLER

37" Torrington, 10 Rolls 1-31/32" Dia. Backed up

48" Aetna Standard, 17 Rolls 3/4" Dia.

54" McKay, 17 Rolls, 3/4" Dia.

108" American, 17 Rolls, 1/2" Dia.

PLANNER—PLATE EDGE

35" Southwark Pneumatic Holddown, Motor Driven,

Capacity 1 1/2"

PRESSES—HYDRAULIC

200 ton Bliss Hydro Dynamic, 36" Stroke Bed Area

30" x 31"

2800 ton Bliss Hydro Dynamic, 12" Stroke, 60-15/18"

Between Columns

1500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE

1earing F-1309-42, 300 ton, 24" Stroke, Bed 44 x 36"

Bliss #1018 Toggle Drawing 1550 ton, Strokes 24"

and 12", Die Space 60" x 72"

PRESSES—TRIMMING

#36 Bliss Coma, 5" Stroke, 26" Bet. Ups

#73 1/2 Bliss 3" Stroke, 18" Bet. Ups

#74 1/2 Bliss 4" Stroke, 27" Bet. Ups

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Cleveland Style EF Single End, 42" Throat

Cleveland Style G Single End, 60" Throat

Cleveland Style W, 60" Throat

No. 1 1/2" Buffalo Universal Ironworker

ROLL—FORMING

11 Stand Daltstrom Roll Forming Mach. With Flying

Pre-Notch Press & Flying Shear. Will take widths

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14 Stand Tishken Model L-M-1, Spindle Dia. 1 1/2"

6 1/2" Between Spindles, 3 1/2" Capacity

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6" x 5" Torrington Wire Flattening Mill Line

8" Bar Mill

18" Three High Bar Mill

10" x 14" Single Stand Two High

12" x 12" Single Stand Two High

12" x 16" Single Stand Two High

16" x 21" Farrel Two Stand Two High

26" x 72" Cold Rolling Mill

44" x 141" Three High Sheet Mill

22" x 40" Three High Sheet Mill

SHEAR—ALLIGATOR

No. 4 Mesta Rill L.K. Capacity 2" x 12"

SHEAR—BAR

No. 12 Buffalo Armor Plate

Capacity 5" to 15" Beams & Channels

SHEARS—SQUARING

8" x 10" Ga. Niagara No. 672

62" x 1 1/4" Peck Stot & Wilcox

8" x 1/4" Niagara—NEW 1952

12" x 1/2" Cincinnati

SLITTERS

25" Blake & Johnson

36" Wean Slitting Line

36" Paxson Slitting Line

STRAIGHTENER

Kane & Rouch Type B Capy. 7 1/2" Hex. Flat

4" x 11/32" Flat & Edge 1 1/2" x 3 1/2"

SWAGING MACHINE

#6 A Fen. Capacity 2 1/2" Tube 3 1/2" Solid 10"

Die Length Hydraulic Feed. LATB

TESTING MACHINES

200,000# Baldwin Universal Hydraulic

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60,000 and 300,000 lb Compression

TUBE MILL

Etna 1K Welded Tube Mill, Cut-off & Transformer

Capv. 1/2" OD 6.28 wall to 2" OD 129 wall

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Drawing from 14 to 27 Rod

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3" bar Universal Tri-Way horizontal, table type.

4" bar Universal Tri-Way horizontal, table type.

GRINDING MACHINES

72" Hanchett 3-spd. rotary surface, new 1946.

No. 74 Heald hyd. pl. internal X-sliding H. S., 1941.

16" x 36" Landis type C hyd. pl. cylindrical, 1942.

45" No. 16A2 Blanchard automatic 2-spd. late (2).

HAMMERS

No. 3C Chambersburg pneumatic, serial No. 2287.

No. 6-1 Nazel, pneumatic, late.

No. 6B Nazel, self-contained.

LATHES

No. 3 Gisholt Univ. Turret Lathe (2), 1942.

No. 5 Gisholt ram type Univ. Turret Lathe, 1940.

15" x 30" Lipe-Matic, 1942.

126" x 96" CC Niles Belmont Pond engine lathe, 80

HP. M.D.

MILLING MACHINES

No. 2 Brown & Sharpe vertical mill, new 1943.

No. 5-48 Cincinnati hydromatic duplex mill, serial

3851DK-5.

No. 2-24 Cincinnati automatic simplex mill, serial

No. 1B3PIT-1.

PRESSES

200 ton Kw. 7-72 Bliss S.S. D.C. Press Air Clutch.

350 ton Elmes self-cont. 4-post Hydraulic Press, 1944.

500 ton No. 1039 Hamilton D.C. adj. bed, 60"x102".

600 ton Model 2E-48-800 Hamilton, S.S. airclutch,

new 1947.

SHAPERS & SLOTTERS

36 Rockford hyd. vertical slotter, new 1944.

UPSETTERS

1 1/2" National Upsetter, guided ram, hard ways.

3" Ajax upsetting & forging machine, air clutch,

serial 3614.

3" National high duty forging machine, serial 14195.

3 1/2" Ajax suspended slides, steel frame.

4" National high duty, susp. & guided rams.

7 1/2" National Upsetter, air clutch, new 1944.

AUTOMATICS

5" 4-spd. Conomatic, serial 5308K3 (1944).

Model 4D & 6D Potter & Johnson (late)

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2" Wallace Hydraulic Pipe Bender

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No. 7 Ajax Forging Press, 700-ton capacity

3-2-ton Denison Auto. Hopper Feed &

Index Table Hydr. Multipress

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Welders

2500 lb. Model E Chambersburg Steam

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Drop Hammer, Motor driven head

1000 lb. Model J-2 Chambersburg Beard

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Saw Grinder

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Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCP	600	400/500
3	1275	G.E.	MCP	415	1300
1	1000	G.E.	MCP	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.	QM	390	250/550
With Unified Gear Set 7:1 Ratio					
1	500	Whse.	CC-218	600	300/900
3	450	Whse.	CC-218	550	415
2	300	G.E.	MPC	230	400
1	250	G.E.	MPC	230	400/600
1	200	Whse.	CB-5113	250	400/800
1	200	Whse.	CB-207.4	250	850/1200
1	150	G.E.	CD B.B.	600	250/700
1	150	Cy Wh.	GS-II	230	1150
2	125	Whse.	SK-183	230	350/1050
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
1	60/100	G.E.	RF-17	230	450/900
2	75	Cy Wh.	SH TEFC	230	860
1	50	G.E.	MD-412-AE	230	550
1	40	Rel.	385F TEFC	230	500/1500
2	30/40	Whse.	BB	230	500/1500
			DP	230	500/1500

MG SETS — 3 Ph. 60 Cy.					
Qu.	KW	Make	DC	AC	Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	2000	G.E.	500		
1	2000	G.E.	25 cy.	660	11000
1	1500	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
3	1000	G.E.	720	600	6600/13200
2	1000	G.E.	514	600	6600/13200
1	750	G.E.	720	125/250	2300/4600
1	500	G.E.	900	540/540	4150
1	500	Whse.	900	125/250	440
2	300	G.E.	1200	250	2300
2	300	Whse.	1200	275	440/2300
1	200	Whse.	1200	550	2300

TRANSFORMERS					
Qu.	KVA	Make	Type	Ph.	

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- 1—28" REVERSING BREAKDOWN MILL.
- 1—25" & 42" x 60" HOT STRIP MILL, 4-high.
- 1—28" PINION STAND, 2-high, modern design.
- 1—16" x 24" COLD MILL, 1 stand.
- 1—4" x 6" 2-HIGH COLD MILL, 5 HP motor, extra rolls.
- 1—16" BAR MILL, 3-high, single stand, with motor and gear reducer.
- 1—10" ROD MILL.
- 2—MECHANICAL COOLING BEDS for bars, 150 ft. and 120 ft. long.
- 1—ROLL FORMING MACHINE, Kane & Roach, for 072" x 5 1/2" wide stock.
- 1—COIL-UP-AND-DOWN ENDER for 54" dia. x 44" wide coils.
- 1—34" x 192" ROLL GRINDER with motors and controls.
- 1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 HP 500/1500 RPM, 230 volts D.C. motor and controls.
- 2—ROLLER LEVELERS, McKay, rolls 80" face x 5 1/2" dia., with gear box and universal spindles.
- 1—STRETCHER LEVELER for sheets, 500,000 lb. capacity.
- 1—KANE & ROACH BAR AND ANGLE STRAIGHTENER, size 25, cap. 4" x 4" x 1/2" angles, 5" channels, 2 1/2" bars.
- 2—KANE & ROACH BAR AND ANGLE STRAIGHTENER, size 24, cap. 3" x 3" x 5/8" angles, 3 1/2" channels and 2" bars.

- 1—21 MEDART STRAIGHTENER, capacity 1/2" to 2 1/2" bars, tubes, extra rolls.
- 3—PICKLING MACHINES for sheets, Mesta.
- 1—SCRUBBER AND DRYER for sheets 66" wide.
- 2—PACK FURNACES for hot sheet mills, 62" x 60", double chamber.
- 1—LOCOMOTIVE, 62 1/2 ton Diesel Electric.
- 2—UNITED HOT SAWS, 50", sliding frame.
- 1—BONNOT BILLETEER, size "A", cap. 3" to 6" squares.
- 1—UNITED 24 BAR SHEAR, vertical open side.
- 1—PELS BILLET AND BAR SHEAR, cap. 7" round, 50 HP motor.
- 1—CRACKER SHEAR, AETNA-STANDARD, 2 1/2" bars.
- 1—WILLIAMS & WHITE bar shear, cap. 1 1/4" sq.
- 1—ROTARY SIDE TRIMMING SHEAR, capacity 112" x 5 1/2" plate.
- 1—192" x 10 GAUGE NIAGARA SQUARING SHEAR, little used.
- 1—156" x 1 1/2" SHEET SQUARING SHEAR.
- 1—120" x 10 GAUGE WYSONG & MILES SQUARING SHEAR.
- 1—SLITTING SHEAR FOR SHEETS, Mesta 92".
- 1—FLYING SHEAR, capacity 1/2" thick x 36" wide in lengths from 2 1/2 ft. to 12 ft.
- 1—156" BRIDGEPORT SHEAR KNIFE GRINDER.

- 1—ALLIANCE LADLE CRANE, 4 girders, 89 ton main hoist, 25 ton auxiliary, 55'5" span, 42' lift.
- 1—DRAWBENCH, Mesta, oil-hydraulic, for 3 strands of bars 20" long.
- 1—66" GALVANIZING LINE for sheets, with 2 roller levelers.
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- 3—LIFT TRUCKS, 5-ton Elwell-Parker.
- 1—3500 HP GEAR DRIVE, 514 to 80 RPM, 6.45 to 1 ratio.
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- 1—1600 HP GEAR DRIVE, 514 to 87 RPM, 5.9 to 1 ratio.
- 1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
- 1—500 HP GEAR DRIVE, 514 to 100 RPM, 5.14 to 1 ratio.
- 1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
- 1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
- 1—500 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 314 RPM.
- 1—MC-30 WEST. MOTOR, 230 V. D.C. back axle brackets and shaft.
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200	Rel. (2)	1400T	850 1200	
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200	Cr. Wh.	CM	500	
175	G.E.	ETC	750	
100	G.E.	MP	400 800	
100	G.E.	RC-24	2500	
100	G.E.	RC-19	575	
100-150	G.E.	MC	380 1000	
50	Cr. Wh.	CMC	700 1100	
35	West. (2)	SK-150	350 1000	
30	Cr. Wh.	CCM-504	450	
30-40	G.E. (2)	CD-123	400 1600	
30-40	G.E.	CD-115	500 1500	
25-30	G.E. (2)	RP-12	500 1500	
25	G.E.	RC-32	900	
25	Westg.	SK-133	575	
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3	2000	Al.Ch.	1	26,400/13,200-2300/4160-Y
3	1667	G.E.	1	4800-480
3	1000	Al.Ch.	1	33,000-2300/4000-Y
3	1000	G.E.	1	22,000-2300/4000-Y
3	500	Kuhlman	1	13,860-230/480
3	333	G.E.	1	13,200-2300/4000-Y
3	333	Kuhlman	1	13,200-240/480
3	333	G.E.	1	4160/7200-120/240/480
6	333	American	1	2400/4160-120/240
1	300	Whse.	3	11,500-440
4*	225	Whse.	3	2400/4160-250/144
1	150	Kuhlman	1	13,200-120/240
1	100	G.E.	1	4160-120/240

*—Dry Type

METAL-CLAD SWITCHGEAR

- 5—G.E. cubicle with type FK-255 draw-out 3-P.S.T. magnetic O.C.B., 600 amps., 15,000-volts, 150,000-L.C.
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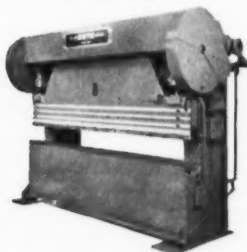
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#120-10	10' x 3/16"	12' Bed
#150-8	8' x 5/16"	10' Bed
#150-10	10' x 1/4"	12' Bed

Purchasers of Cyril Bath Brakes are entitled to services of a factory representative to assist and supervise installation, and instruct personnel in operation and maintenance. NO CHARGE FOR THIS SERVICE.

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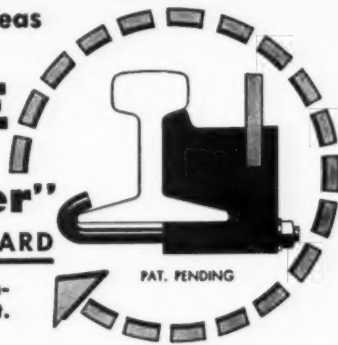
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DYNAMOMETER

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A PRECISION INSTRUMENT WHERE QUICK
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Used by: Leading industrial plants, experimental shops, schools, universities, branches of govt.

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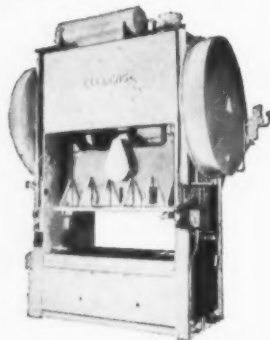
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ICC Refuses Ore Freight Rate Cut

The Interstate Commerce Commission for the second time refused to permit reduced rates on carload shipments of iron ore from Boston ports to the Youngstown area. The reductions, proposed by three railroads, are not "just and reasonable," the ICC rules. The carriers proposed to lower their rates to \$3.03 a gross ton. The present rate is \$8.25.

Urgency Scale for Critical Tools

Military purchase orders for the most critically-needed machine tools will now be rated for delivery on an "urgency scale." Builders receiving orders from the armed forces will be required to follow this numerical preference list. The ruling does not affect deliveries to civilian customers.

Republic Builds New Plant

A plant for producing riveted corrugated metal drainage products will be built by Republic Steel Corp. at Charlotte, N. C. It will be operated by the company's Culvert Div. Completion is expected late this year.

Research Outlays May Pass \$6 Billion

U. S. industry will spend \$6.3 billion for research in 1957, says Gwilym Price, president, Westinghouse Electric Corp. About 20 pct of the total, he estimates, will come from the electrical industry, which will spend six cents of every sales dollar on research. Only the aircraft industry is spending at a higher ratio.

French Plan Mill At Dunkirk

Although no official decision has yet been made, French newspaper reports consider it certain that a 500,000 ton steel plant at Dunkirk will be included in the French steel industry's third development plan. The industry aims at 17 million tons annual capacity by 1960-61.

Roundhouse Becomes Beryllium Plant

Conversion of a railroad roundhouse into a beryllium extraction plant is being accomplished by Beryllium Corp., at Ashmore, Pa. The firm is spending \$4 million on the project, which will be completed in August. Output for the first five years has already been sold to the Atomic Energy Commission.

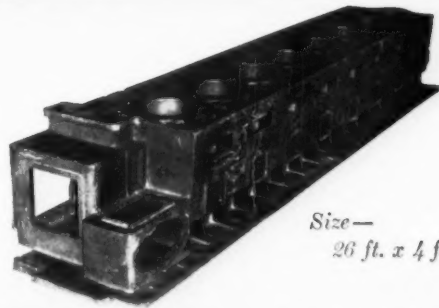
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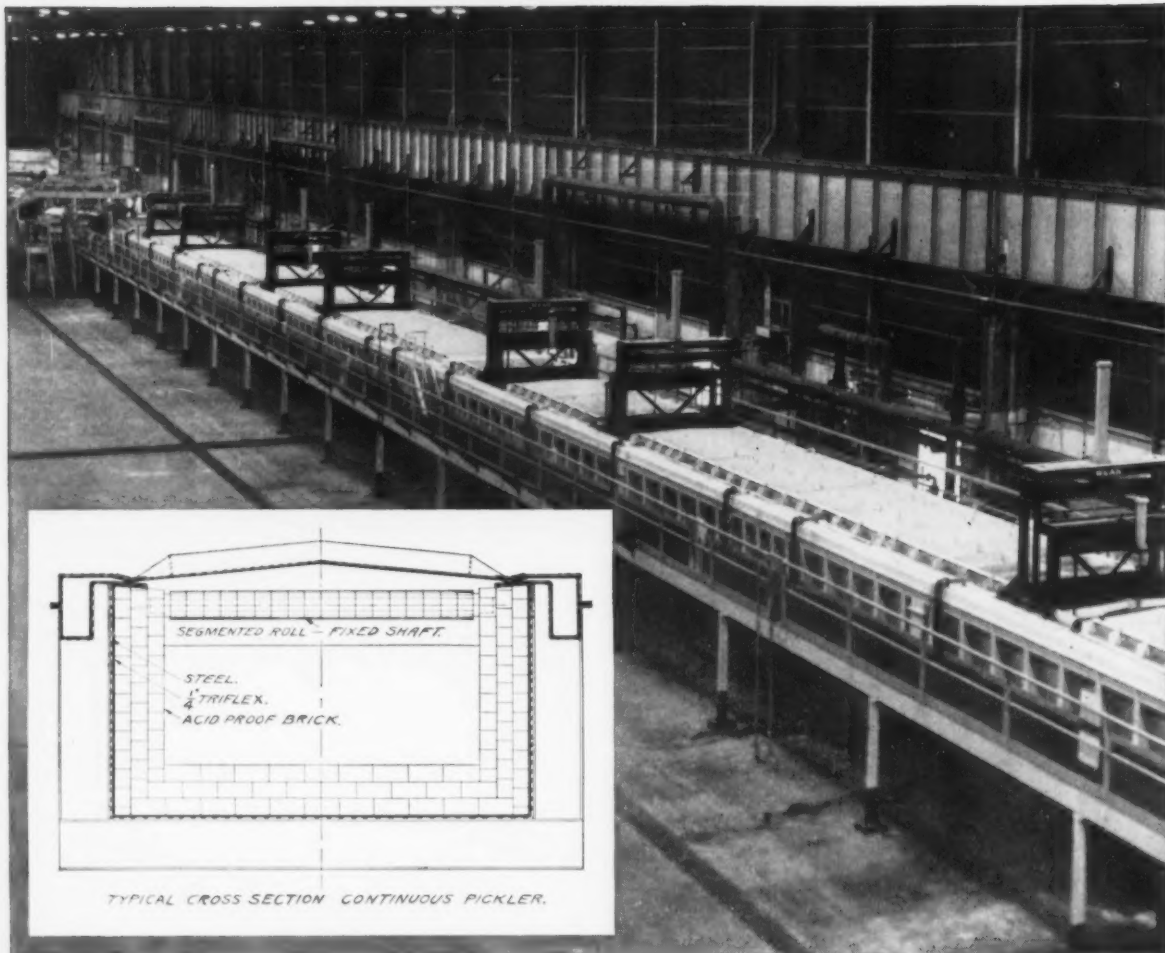
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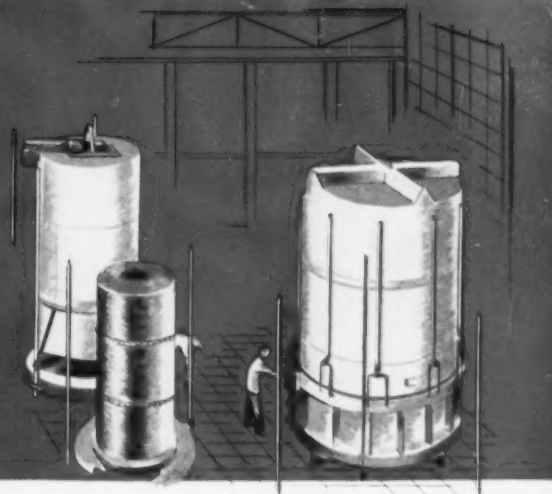
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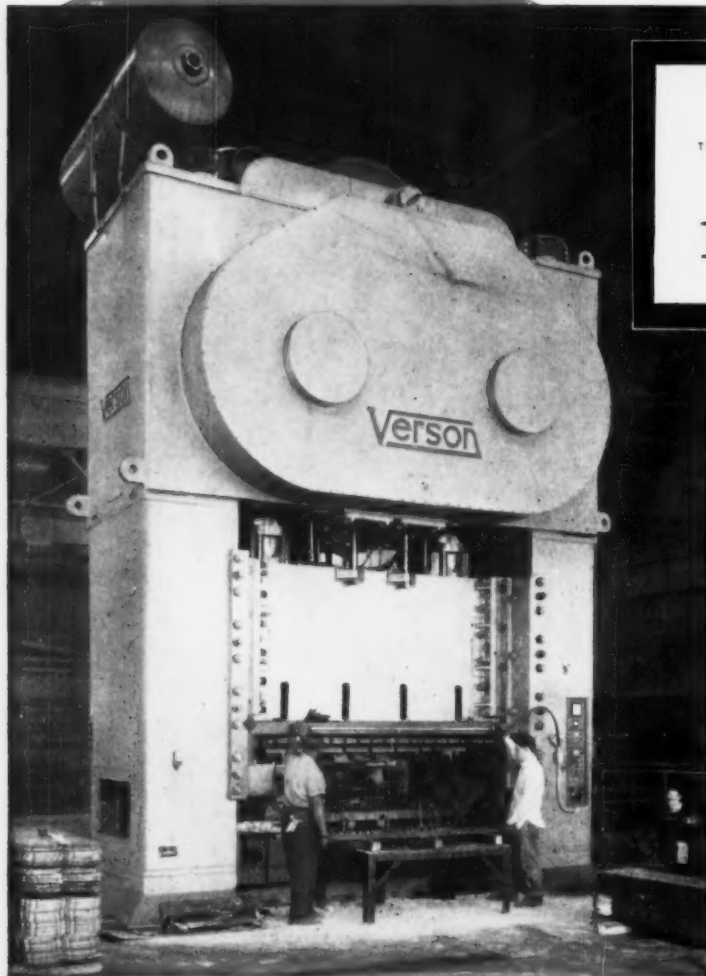
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